RETURN TO MAIN MENU

Power Feed 10 Wire Drive & Control Box
Boom Mount or Bench Model

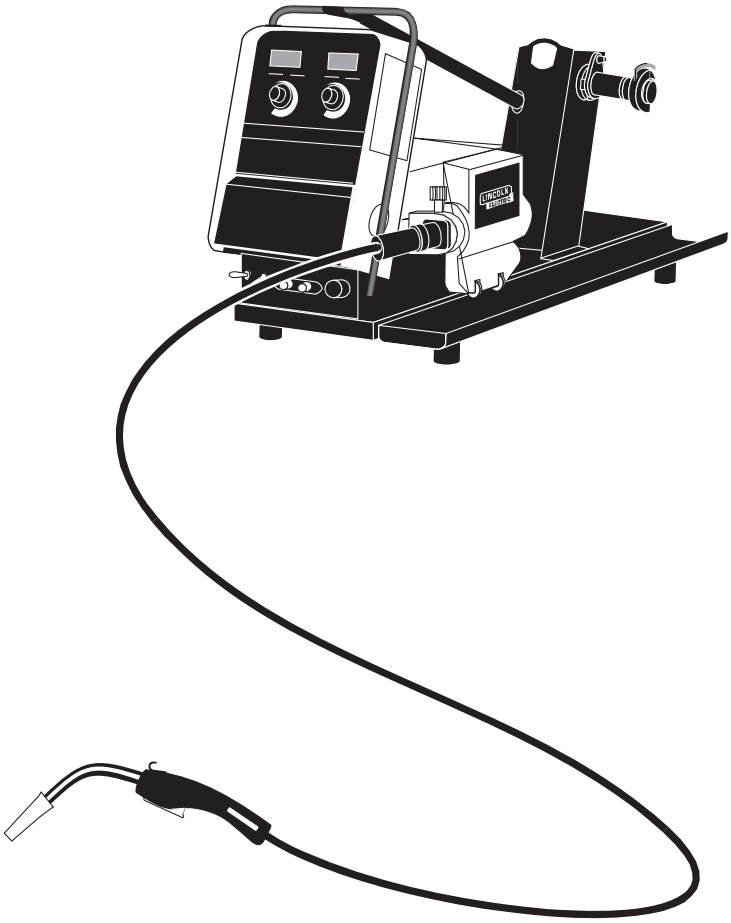
IM584-D

August, 2007

For use with: Power Feed 10 Control Box - Boom Mount Code 10436, 10615
Power Feed 10 Wire Drive - Boom Mount Code 10437,10616, 10782
Power Feed 10 Boom Package Code 10435, 10612 (Generic), 10493, 10613 (12' Zipline), 10494, 10614 (16' Zipline), 10779 (Generic), 10767, 10780 (12' Zipline), 10768, 10781 (16' Zipline)
Power Feed 10 Bench Model Code 10438, 10617, 10760,10783

Safety Depends on You

Lincoln arc welding and cutting equipment is designed and built with safety in mind. However, your overall safety can be increased by proper installation ... and thoughtful operation on your part. **DO NOT INSTALL, OPERATE OR REPAIR THIS EQUIPMENT WITHOUT READING THIS MANUAL AND THE SAFETY PRECAUTIONS CONTAINED THROUGHOUT.** And, most importantly, think before you act and be careful.



OPERATOR'S MANUAL

ISO 9001
Designed and Manufactured Under a Quality Program Certified by ABS Quality Evaluations, Inc. to ISO 9001 Requirements.
CERTIFICATE NUMBER: 30273

Copyright © 2007 Lincoln Global Inc.

LINCOLN® ELECTRIC

• World's Leader in Welding and Cutting Products •
• Sales and Service through Subsidiaries and Distributors Worldwide •
Cleveland, Ohio 44117-1199 U.S.A. TEL: 216.481.8100 FAX: 216.486.1751 WEB SITE: www.lincolnelectric.com

⚠ WARNING

⚠ CALIFORNIA PROPOSITION 65 WARNINGS ⚠

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.

The Above For Diesel Engines

The engine exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm.

The Above For Gasoline Engines

ARC WELDING CAN BE HAZARDOUS. PROTECT YOURSELF AND OTHERS FROM POSSIBLE SERIOUS INJURY OR DEATH. KEEP CHILDREN AWAY. PACEMAKER WEARERS SHOULD CONSULT WITH THEIR DOCTOR BEFORE OPERATING.

Read and understand the following safety highlights. For additional safety information, it is strongly recommended that you purchase a copy of "Safety in Welding & Cutting - ANSI Standard Z49.1" from the American Welding Society, P.O. Box 351040, Miami, Florida 33135 or CSA Standard W117.2-1974. A Free copy of "Arc Welding Safety" booklet E205 is available from the Lincoln Electric Company, 22801 St. Clair Avenue, Cleveland, Ohio 44117-1199.

BE SURE THAT ALL INSTALLATION, OPERATION, MAINTENANCE AND REPAIR PROCEDURES ARE PERFORMED ONLY BY QUALIFIED INDIVIDUALS.

FOR ENGINE powered equipment.

1.a. Turn the engine off before troubleshooting and maintenance work unless the maintenance work requires it to be running.

1.b. Operate engines in open, well-ventilated areas or vent the engine exhaust fumes outdoors.

1.c. Do not add the fuel near an open flame welding arc or when the engine is running. Stop the engine and allow it to cool before refueling to prevent spilled fuel from vaporizing on contact with hot engine parts and igniting. Do not spill fuel when filling tank. If fuel is spilled, wipe it up and do not start engine until fumes have been eliminated.

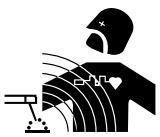
1.d. Keep all equipment safety guards, covers and devices in position and in good repair.Keep hands, hair, clothing and tools away from V-belts, gears, fans and all other moving parts when starting, operating or repairing equipment.

1.e. In some cases it may be necessary to remove safety guards to perform required maintenance. Remove guards only when necessary and replace them when the maintenance requiring their removal is complete. Always use the greatest care when working near moving parts.

1.f. Do not put your hands near the engine fan. Do not attempt to override the governor or idler by pushing on the throttle control rods while the engine is running.

1.g. To prevent accidentally starting gasoline engines while turning the engine or welding generator during maintenance work, disconnect the spark plug wires, distributor cap or magneto wire as appropriate.

1.h. To avoid scalding, do not remove the radiator pressure cap when the engine is hot.



ELECTRIC AND MAGNETIC FIELDS may be dangerous

2.a. Electric current flowing through any conductor causes localized Electric and Magnetic Fields (EMF). Welding current creates EMF fields around welding cables and welding machines

2.b. EMF fields may interfere with some pacemakers, and welders having a pacemaker should consult their physician before welding.

2.c. Exposure to EMF fields in welding may have other health effects which are now not known.

2.d. All welders should use the following procedures in order to minimize exposure to EMF fields from the welding circuit:

2.d.1. Route the electrode and work cables together - Secure them with tape when possible.

2.d.2. Never coil the electrode lead around your body.

2.d.3. Do not place your body between the electrode and work cables. If the electrode cable is on your right side, the work cable should also be on your right side.

2.d.4. Connect the work cable to the workpiece as close as possible to the area being welded.

2.d.5. Do not work next to welding power source.

Mar '95

ELECTRIC SHOCK can kill.

3.a. The electrode and work (or ground) circuits are electrically "hot" when the welder is on. Do not touch these "hot" parts with your bare skin or wet clothing. Wear dry, hole-free gloves to insulate hands.

3.b. Insulate yourself from work and ground using dry insulation. Make certain the insulation is large enough to cover your full area of physical contact with work and ground.

In addition to the normal safety precautions, if welding must be performed under electrically hazardous conditions (in damp locations or while wearing wet clothing; on metal structures such as floors, gratings or scaffolds; when in cramped positions such as sitting, kneeling or lying, if there is a high risk of unavoidable or accidental contact with the workpiece or ground) use the following equipment:

- **Semiautomatic DC Constant Voltage (Wire) Welder.**
- **DC Manual (Stick) Welder.**
- **AC Welder with Reduced Voltage Control.**

3.c. In semiautomatic or automatic wire welding, the electrode, electrode reel, welding head, nozzle or semiautomatic welding gun are also electrically "hot".

3.d. Always be sure the work cable makes a good electrical connection with the metal being welded. The connection should be as close as possible to the area being welded.

3.e. Ground the work or metal to be welded to a good electrical (earth) ground.

3.f. Maintain the electrode holder, work clamp, welding cable and welding machine in good, safe operating condition. Replace damaged insulation.

3.g. Never dip the electrode in water for cooling.

3.h. Never simultaneously touch electrically "hot" parts of electrode holders connected to two welders because voltage between the two can be the total of the open circuit voltage of both welders.

3.i. When working above floor level, use a safety belt to protect yourself from a fall should you get a shock.

3.j. Also see Items 6.c. and 8.

ARC RAYS can burn.

4.a. Use a shield with the proper filter and cover plates to protect your eyes from sparks and the rays of the arc when welding or observing open arc welding. Headshield and filter lens should conform to ANSI Z87. I standards.

4.b. Use suitable clothing made from durable flame-resistant material to protect your skin and that of your helpers from the arc rays.

4.c. Protect other nearby personnel with suitable, non-flammable screening and/or warn them not to watch the arc nor expose themselves to the arc rays or to hot spatter or metal.

FUMES AND GASES can be dangerous.

5.a. Welding may produce fumes and gases hazardous to health. Avoid breathing these fumes and gases. When welding, keep your head out of the fume. Use enough ventilation and/or exhaust at the arc to keep fumes and gases away from the breathing zone. **When welding with electrodes which require special ventilation such as stainless or hard facing (see instructions on container or MSDS) or on lead or cadmium plated steel and other metals or coatings which produce highly toxic fumes, keep exposure as low as possible and below Threshold Limit Values (TLV) using local exhaust or mechanical ventilation. In confined spaces or in some circumstances, outdoors, a respirator may be required. Additional precautions are also required when welding on galvanized steel.**

5. b. The operation of welding fume control equipment is affected by various factors including proper use and positioning of the equipment, maintenance of the equipment and the specific welding procedure and application involved. Worker exposure level should be checked upon installation and periodically thereafter to be certain it is within applicable OSHA PEL and ACGIH TLV limits.

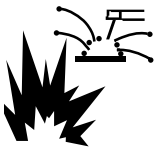
5.c. Do not weld in locations near chlorinated hydrocarbon vapors coming from degreasing, cleaning or spraying operations. The heat and rays of the arc can react with solvent vapors to form phosgene, a highly toxic gas, and other irritating products.

5.d. Shielding gases used for arc welding can displace air and cause injury or death. Always use enough ventilation, especially in confined areas, to insure breathing air is safe.

5.e. Read and understand the manufacturer's instructions for this equipment and the consumables to be used, including the material safety data sheet (MSDS) and follow your employer's safety practices. MSDS forms are available from your welding distributor or from the manufacturer.

5.f. Also see item 1.b.

AUG 06



WELDING and CUTTING SPARKS can cause fire or explosion.

6.a. Remove fire hazards from the welding area. If this is not possible, cover them to prevent the welding sparks from starting a fire. Remember that welding sparks and hot materials from welding can easily go through small cracks and openings to adjacent areas. Avoid welding near hydraulic lines. Have a fire extinguisher readily available.

6.b. Where compressed gases are to be used at the job site, special precautions should be used to prevent hazardous situations. Refer to "Safety in Welding and Cutting" (ANSI Standard Z49.1) and the operating information for the equipment being used.

6.c. When not welding, make certain no part of the electrode circuit is touching the work or ground. Accidental contact can cause overheating and create a fire hazard.

6.d. Do not heat, cut or weld tanks, drums or containers until the proper steps have been taken to insure that such procedures will not cause flammable or toxic vapors from substances inside. They can cause an explosion even though they have been "cleaned". For information, purchase "Recommended Safe Practices for the Preparation for Welding and Cutting of Containers and Piping That Have Held Hazardous Substances", AWS F4.1 from the American Welding Society (see address above).

6.e. Vent hollow castings or containers before heating, cutting or welding. They may explode.

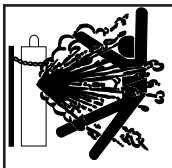
6.f. Sparks and spatter are thrown from the welding arc. Wear oil free protective garments such as leather gloves, heavy shirt, cuffless trousers, high shoes and a cap over your hair. Wear ear plugs when welding out of position or in confined places. Always wear safety glasses with side shields when in a welding area.

6.g. Connect the work cable to the work as close to the welding area as practical. Work cables connected to the building framework or other locations away from the welding area increase the possibility of the welding current passing through lifting chains, crane cables or other alternate circuits. This can create fire hazards or overheat lifting chains or cables until they fail.

6.h. Also see item 1.c.

6.I. Read and follow NFPA 51B " Standard for Fire Prevention During Welding, Cutting and Other Hot Work", available from NFPA, 1 Batterymarch Park,PO box 9101, Quincy, Ma 022690-9101.

6.j. Do not use a welding power source for pipe thawing.



CYLINDER may explode if damaged.

7.a. Use only compressed gas cylinders containing the correct shielding gas for the process used and properly operating regulators designed for the gas and pressure used. All hoses, fittings, etc. should be suitable for the application and maintained in good condition.

7.b. Always keep cylinders in an upright position securely chained to an undercarriage or fixed support.

7.c. Cylinders should be located:
- Away from areas where they may be struck or subjected to physical damage.
- A safe distance from arc welding or cutting operations and any other source of heat, sparks, or flame.

7.d. Never allow the electrode, electrode holder or any other electrically "hot" parts to touch a cylinder.

7.e. Keep your head and face away from the cylinder valve outlet when opening the cylinder valve.

7.f. Valve protection caps should always be in place and hand tight except when the cylinder is in use or connected for use.

7.g. Read and follow the instructions on compressed gas cylinders, associated equipment, and CGA publication P-l, "Precautions for Safe Handling of Compressed Gases in Cylinders," available from the Compressed Gas Association 1235 Jefferson Davis Highway, Arlington, VA 22202.

FOR ELECTRICALLY powered equipment.

8.a. Turn off input power using the disconnect switch at the fuse box before working on the equipment.

8.b. Install equipment in accordance with the U.S. National Electrical Code, all local codes and the manufacturer's recommendations.

8.c. Ground the equipment in accordance with the U.S. National Electrical Code and the manufacturer's recommendations.

Jan, 07

PRÉCAUTIONS DE SÛRETÉ

Pour votre propre protection lire et observer toutes les instructions et les précautions de sûreté specifiques qui parraissent dans ce manuel aussi bien que les précautions de sûreté générales suivantes:

Sûreté Pour Soudage A L'Arc

1. Protegez-vous contre la secousse électrique:

   a. Les circuits à l'électrode et à la piéce sont sous tension quand la machine à souder est en marche. Eviter toujours tout contact entre les parties sous tension et la peau nue ou les vétements mouillés. Porter des gants secs et sans trous pour isoler les mains.
   b. Faire trés attention de bien s'isoler de la masse quand on soude dans des endroits humides, ou sur un plancher metallique ou des grilles metalliques, principalement dans les positions assis ou couché pour lesquelles une grande partie du corps peut être en contact avec la masse.
   c. Maintenir le porte-électrode, la pince de masse, le câble de soudage et la machine à souder en bon et sûr état defonctionnement.
   d. Ne jamais plonger le porte-électrode dans l'eau pour le refroidir.
   e. Ne jamais toucher simultanément les parties sous tension des porte-électrodes connectés à deux machines à souder parce que la tension entre les deux pinces peut être le total de la tension à vide des deux machines.
   f. Si on utilise la machine à souder comme une source de courant pour soudage semi-automatique, ces precautions pour le porte-électrode s'applicuent aussi au pistolet de soudage.

2. Dans le cas de travail au dessus du niveau du sol, se protéger contre les chutes dans le cas ou on recoit un choc. Ne jamais enrouler le câble-électrode autour de n'importe quelle partie du corps.

3. Un coup d'arc peut être plus sévère qu'un coup de soliel, donc:

   a. Utiliser un bon masque avec un verre filtrant approprié ainsi qu'un verre blanc afin de se protéger les yeux du rayonnement de l'arc et des projections quand on soude ou quand on regarde l'arc.
   b. Porter des vêtements convenables afin de protéger la peau de soudeur et des aides contre le rayonnement de l'arc.
   c. Protéger l'autre personnel travaillant à proximité au soudage à l'aide d'écrans appropriés et non-inflammables.

4. Des gouttes de laitier en fusion sont émises de l'arc de soudage. Se protéger avec des vêtements de protection libres de l'huile, tels que les gants en cuir, chemise épaisse, pantalons sans revers, et chaussures montantes.

5. Toujours porter des lunettes de sécurité dans la zone de soudage. Utiliser des lunettes avec écrans lateraux dans les zones où l'on pique le laitier.

6. Eloigner les matériaux inflammables ou les recouvrir afin de prévenir tout risque d'incendie dû aux étincelles.

7. Quand on ne soude pas, poser la pince à une endroit isolé de la masse. Un court-circuit accidental peut provoquer un échauffement et un risque d'incendie.

8. S'assurer que la masse est connectée le plus prés possible de la zone de travail qu'il est pratique de le faire. Si on place la masse sur la charpente de la construction ou d'autres endroits éloignés de la zone de travail, on augmente le risque de voir passer le courant de soudage par les chaines de levage, câbles de grue, ou autres circuits. Cela peut provoquer des risques d'incendie ou d'echauffement des chaines et des câbles jusqu'à ce qu'ils se rompent.

9. Assurer une ventilation suffisante dans la zone de soudage. Ceci est particuliérement important pour le soudage de tôles galvanisées plombées, ou cadmiées ou tout autre métal qui produit des fumeés toxiques.

10. Ne pas souder en présence de vapeurs de chlore provenant d'opérations de dégraissage, nettoyage ou pistolage. La chaleur ou les rayons de l'arc peuvent réagir avec les vapeurs du solvant pour produire du phosgéne (gas fortement toxique) ou autres produits irritants.

11. Pour obtenir de plus amples renseignements sur la sûreté, voir le code "Code for safety in welding and cutting" CSA Standard W 117.2-1974.

PRÉCAUTIONS DE SÛRETÉ POUR LES MACHINES À SOUDER À TRANSFORMATEUR ET À REDRESSEUR

1. Relier à la terre le chassis du poste conformement au code de l'électricité et aux recommendations du fabricant. Le dispositif de montage ou la piece à souder doit être branché à une bonne mise à la terre.

2. Autant que possible, l'installation et l'entretien du poste seront effectués par un électricien qualifié.

3. Avant de faires des travaux à l'interieur de poste, la debrancher à l'interrupteur à la boite de fusibles.

4. Garder tous les couvercles et dispositifs de sûreté à leur place.

Mar. '93

Thank You for selecting a **QUALITY** product by Lincoln Electric. We want you to take pride in operating this Lincoln Electric Company product ••• as much pride as we have in bringing this product to you!

CUSTOMER ASSISTANCE POLICY

The business of The Lincoln Electric Company is manufacturing and selling high quality welding equipment, consumables, and cutting equipment. Our challenge is to meet the needs of our customers and to exceed their expectations. On occasion, purchasers may ask Lincoln Electric for advice or information about their use of our products. We respond to our customers based on the best information in our possession at that time. Lincoln Electric is not in a position to warrant or guarantee such advice, and assumes no liability, with respect to such information or advice. We expressly disclaim any warranty of any kind, including any warranty of fitness for any customer's particular purpose, with respect to such information or advice. As a matter of practical consideration, we also cannot assume any responsibility for updating or correcting any such information or advice once it has been given, nor does the provision of information or advice create, expand or alter any warranty with respect to the sale of our products.

Lincoln Electric is a responsive manufacturer, but the selection and use of specific products sold by Lincoln Electric is solely within the control of, and remains the sole responsibility of the customer. Many variables beyond the control of Lincoln Electric affect the results obtained in applying these types of fabrication methods and service requirements.

Subject to Change – This information is accurate to the best of our knowledge at the time of printing. Please refer to www.lincolnelectric.com for any updated information.

Please Examine Carton and Equipment For Damage Immediately

When this equipment is shipped, title passes to the purchaser upon receipt by the carrier. Consequently, Claims for material damaged in shipment must be made by the purchaser against the transportation company at the time the shipment is received.

Please record your equipment identification information below for future reference. This information can be found on your machine nameplate.

Product _____

Model Number _____

Code Number or Date Code_____

Serial Number_____

Date Purchased_____

Where Purchased_____

Whenever you request replacement parts or information on this equipment, always supply the information you have recorded above. The code number is especially important when identifying the correct replacement parts.

On-Line Product Registration

- Register your machine with Lincoln Electric either via fax or over the Internet.
  - For faxing: Complete the form on the back of the warranty statement included in the literature packet accompanying this machine and fax the form per the instructions printed on it.
  - For On-Line Registration: Go to our **WEB SITE at www.lincolnelectric.com.** Choose "Quick Links" and then "Product Registration". Please complete the form and submit your registration.

Read this Operators Manual completely before attempting to use this equipment. Save this manual and keep it handy for quick reference. Pay particular attention to the safety instructions we have provided for your protection. The level of seriousness to be applied to each is explained below:

⚠ WARNING

This statement appears where the information **must** be followed **exactly** to avoid **serious personal injury** or **loss of life**.

⚠ CAUTION

This statement appears where the information **must** be followed to avoid **minor personal injury** or **damage to this equipment**.

TABLE OF CONTENTS

Page

Installation ..... Section A
- Technical Specifications A-1
- Safety Precautions A-2
- Mounting the Wire Drive Unit A-2
  - Boom Mounting of Wire Drive A-2
  - Electrode Routing A-2
- Mounting the Control Box and Receptacle Configuration A-2
  - Separating the Control Box from the Wire Drive (Bench Model Only) A-2
  - Mounting the Control Box (Boom or Separated Bench Models) A-3
  - Determining Receptacle Configuration A-3
  - Mounting on Power Source A-3
- Control Cable A-3
  - Control Cable Connections A-3
  - Control Cable Specifications A-4
  - Available Cable Assemblies A-4
  - Electrode Cable Connections A-4
  - Work Cable Connections A-5
- Wire Drive Gear Ratio (High or Low Speed) A-5
  - Selecting the Proper Gear Ratio A-5
  - Changing the Wire Drive Ratio A-5
- DIP Switch Setup A-7
  - Setting DIP Switches in the Control Box and Wire Drive ..... A-7 thru A-10
- Wire Feed Drive Roll Kits A-11
- Procedure to Install Drive Rolls and Wire Guides A-11
- Gun and Cable Assemblies with Standard Connection A-11
- Gun and Cable Assemblies with Fast-Mate Connection A-11
- General Gun Connection Guidelines A-12
- GMAW Shielding Gas A-13
  - Gas Guard Regulator A-13
- Wire Spindle Placement A-13
- Water Connections (For Water Cooled Guns) A-13
- Wire Feed Shut Down Circuit (Optional) A-13
- Optional Features Installation A-14
- Optional Panels for Control Box A-14
- General Panel Installation Guidelines A-14
- Boom and Bench Conversions A-14

Operation ..... Section B
- Safety Precautions B-1
- Product Description B-1
- Recommended Processes and Equipment B-1
- Duty Cycle B-1
- Control Box Operation B-1
- Operation with Previous Software Versions B-6
- Wire Drive Operation B-6
  - 2 Step/4 Step Switch Operation B-6
  - Cold Feed/Gas Purge Switch B-6
- Wire Drive - PC Board Adjustments B-7
- Wire Reel Loading B-7
- Feeding Electrode and Brake Adjustment B-9
- Drive Roll Pressure Setting B-9
- Procedure for Setting Angle of Feedplate B-9
- Gas Guard Regulator Setting B-9
- Making a Weld B-10
- Wire Reel Changing B-10
- Wire Feed Overload Protection B-10
- Component Status Lights B-11
  - Status Light States B-11

Accessories ..... Section C
- Drive Roll and Guide Tube Kits C-1
- Other Accessories C-2

Maintenance ..... Section D
- Safety Precautions D-1
- Routine Maintenance D-1
- Avoiding Wire Feeding Problems D-1
- Periodic Maintenance D-1
- Procedure for Removing Feedplate from Wire Feeder D-1

TABLE OF CONTENTS

Page

Troubleshooting .....Section E
Safety Precautions E-1
Troubleshooting Guide E-2
Procedure for Replacing PC Boards E-13

Diagrams .....Section F
Wiring (Power Feed 10 Control Box) F-1
Wiring (Power Feed 10 Feed Head) F-2
Dimension Print.....F-3

Parts Lists .....P306 Series

TECHNICAL SPECIFICATIONS – Power Feed 10 Wire Drive & Control Box

WIRE DRIVE OR WIRE DRIVE SECTION OF FEEDER							
SPEC.#	TYPE	LOW SPEED RATIO			HIGH SPEED RATIO		
			Wire Size			Wire Size	
		Low Speed	Solid	Cored	High Speed	Solid	Cored
K1540-1 K1540-2	Power Feed 10 Wire Drive	50-800 IPM (1.27-20.3 m/m)	.025 - 3/32 in. (0.6 - 2.4 mm)	.035 - .125 in (0.9 - 3.2 mm)	75 - 1200 IPM (2.03 - 30.5 m/m)	.025 - 1/16 in. (0.6 - 1.6 mm)	.035 - 5/64 in. (0.9 - 2.0 mm)
K1538-1, -2,-3,-4, -5,-6	Power Feed 10 Boom Package#	50-800 IPM (1.27-20.3 m/m)	.025 - 3/32 in. (0.6 - 2.4 mm)	.035 - .125 in (0.9 - 3.2 mm)	75 - 1200 IPM (2.03 - 30.5 m/m)	.025 - 1/16 in. (0.6 - 1.6 mm)	.035 - 5/64 in. (0.9 - 2.0 mm)
K1541-1 K1541-2	Power Feed 10 Bench Model Drive and Control Box	50-800 IPM (1.27-20.3 m/m)	.025 - 3/32 in. (0.6 - 2.4 mm)	.035 - .125 in (0.9 - 3.2 mm)	75 - 1200 IPM (2.03 - 30.5 m/m)	.025 - 1/16 in. (0.6 - 1.6 mm)	.035 - 5/64 in. (0.9 - 2.0 mm)

CONTROL BOX, WIRE DRIVE AND COMPLETE UNITS								
SPEC.#	TYPE	INPUT POWER	PHYSICAL SIZE•				TEMPERATURE RATING	
			Dimensions					
			Height	Width	Depth	Weight	Operating	Storage
K1539-1,-2 (Control Box Only)*	Power Feed 10 Control Box	40 VDC	13.0 ” (330 mm)	8.50 ” (215 mm)	4.0 ” (105 mm)	8.5 Lbs (3.8 Kg)	+40°C to -20°C	+40°C to -40°C
K1540-1,-2 (Wire Drive Only)*	Power Feed 10 Wire Drive	40 VDC	7.6” (195 mm)	12.9 ” (325 mm)	13.7” (345 mm)	30 Lbs (13.6 Kg)		
K1541-1,-2 Bench Model FeederΔ	Power Feed 10 Bench Model Drive and Control Box	40 VDC	18.5” (470 mm)	13.5” (345 mm)	30.5” (775 mm)	62 Lbs (28.1 Kg.)		

* Also part of K1538-[ ] Boom package and K1541-[ ] Bench Feeder.
Δ Dimensions do not include wire reel.
For Control Box and wire drive dimensions and weights, see individual component listings.

SAFETY PRECAUTIONS

ELECTRIC SHOCK can kill.

- Only qualified personnel should perform this installation.
- Turn off the input power to the power source at the disconnect switch or fuse box before working on this equipment. Turn off the input power to any other equipment connected to the welding system at the disconnect switch or fuse box before working on this equipment.
- Do not touch electrically hot parts.
- Always connect the Power Wave grounding lug (located inside the reconnect input access door) to a proper safety (Earth) ground.

MOUNTING THE WIRE DRIVE UNIT

BOOM MOUNTING OF WIRE DRIVE UNIT

Mount the wire drive unit by means of the 4 holes in the bottom of the wire drive case. (See Figure A.1) The gearbox assembly is electrically "hot" when the gun trigger is pressed. Therefore, make certain the gearbox does not come in contact with the structure on which the unit is mounted.

The wire feed unit should be mounted so that the drive rolls are in a vertical plane, so that dirt will not collect in the drive roll area. Position the mechanism so it will point down at about a 45° angle so the wire feed gun cable will not be bent sharply as it comes from the unit.

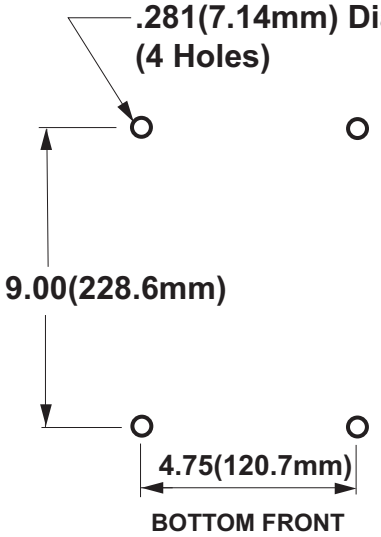


FIGURE A.1

ELECTRODE ROUTING

The electrode supply may be either from reels, Readi-Reels, spools, or bulk packaged drums or reels. Observe the following precautions:

a) The electrode must be routed to the wire drive unit so that the bends in the wire are at a minimum, and also that the force required to pull the wire from the reel into the wire drive unit is kept at a minimum.

b) The electrode is "hot" when the gun trigger is pressed and must be insulated from the boom and structure.

c) If more than one wire feed unit shares the same boom and are not sharing the some power source output stud, their wire and reels must be insulated from each other as well as insulated from their mounting structure.

MOUNTING CONTROL BOX AND RECEPTACLE CONFIGURATION

The Control Box is designed for use in a variety of configurations. A boom model feeder is shipped from the factory separated from the Wire Drive, with the necessary receptacles installed. In the case of a bench model feeder, the Control Box can be removed from the Wire Drive and mounted in a location convenient to the user. Doing so requires separating the Control Box from the Wire Drive, mounting the Control Box in the desired location, determining which receptacle configuration is best for the application and installing the receptacle or receptacles for connecting control cables in the chosen configuration.

SEPARATING THE CONTROL BOX FROM THE WIRE DRIVE (BENCH MODEL ONLY)

1. Remove the bottom and center option panels from the front of the Control Box.
2. Disconnect the Control Box to Wire Drive connection by disconnecting the 6-pin plug located in the hole which passes through the lower back of the Control Box to the Wire Drive.
3. Loosen the four screws inside the Control Box located along the sides of the back of the Control Box, two near the bottom and two near the middle.
4. Push the Control Box upwards and pull away from the Wire Drive.

5. Remove plug button taped to inside of Control Box and insert it into hole on front panel of the Wire Drive.

MOUNTING THE CONTROL BOX (BOOM OR SEPARATED BENCH MODELS)

The back plate of the Control Box has four keyhole slots for mounting. See Figure A.2 for the size and location of these slots. #10 screws are recommended for mounting.

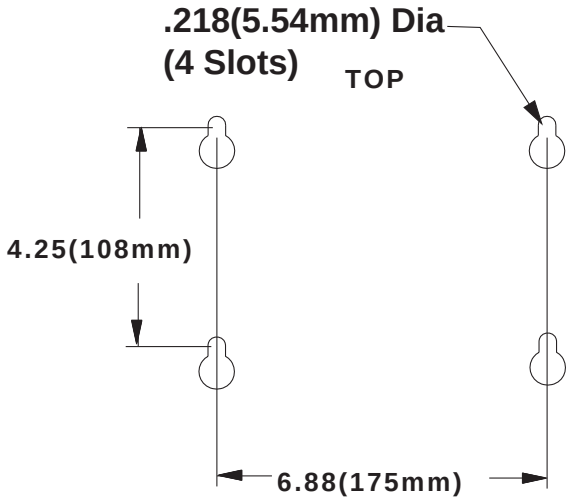


FIGURE A.2

DETERMINING RECEPTACLE CONFIGURATION

The components in a Power Wave / Power Feed system are connected in a 'daisy chained' fashion. This means that the first component in the system (always the Power Wave 455) must have an output receptacle. The last component in the system (typically the Wire Drive) must have an input receptacle. Every component in between must have both an input and output receptacle. (Output receptacles are characterized by having insulated 'socket' connections, while input receptacles have uninsulated 'pin' connections.)

In a factory supplied bench system, the Power Wave 455 has an output receptacle, and the Wire Drive has an input receptacle. The connection between the Control Box and the Wire Drive is internal; no external cables or receptacles are required.

In a factory supplied boom system, the Power Wave 455 has an output receptacle, the Control Box has both input and output receptacles, and the Wire Drive has an input receptacle.

If a bench feeder is to be converted to a typical boom feeder, both input and output receptacles must be installed in the Control Box. An Input/Output Receptacle Kit, K1548-1, is available for this purpose. Instructions for installing the receptacles in a Control Box are included with the kit.

Alternately, a bench feeder can be converted to a non-typical boom system by installing an output receptacle in a Wire Drive (use K1549-1) and an input receptacle in a Control Box (use K1550-1). This system would meet the rule stated above: This means that the first component in the system (the Power Wave 455) has an output receptacle. The last component in the system (the Control Box) has an input receptacle. The component in between (the Wire Drive) has both an input and output receptacle.

A Control Box can be mounted to the front of a Power Wave 455. When mounting a Control Box removed from a bench feeder, no receptacles are required; all connections are internal. When mounting a Control Box configured as part of a boom system (both input and output receptacles are already installed in the Control Box) the receptacles do not get used. The wiring harness from either J1 or J2 (the signals are identical) must be disconnected from the harness on the back of one of the receptacles (internally). This open connector is then used during mounting to the Power Wave 455.

MOUNTING ON POWER SOURCE

Complete instructions for mounting a Control Box to the front of a Power Wave 455 are included in the Power Wave 455 Operator's manual.

CONTROL CABLE

CONTROL CABLE CONNECTIONS

- All system control cables are the same.
- All control cables can be connected end to end to extend their length.
- All system equipment must be connected to a control cable.

The Power Wave / Power Feed Wire Feeders offer flexibility in the connection of system components. This system uses the same type of control cable between all of the system components. Connections can be "daisy chained" from one system component to another. Components can be connected in any order, as long as the proper input and output receptacles are present. See MOUNTING CONTROL BOX AND RECEPTACLE CONFIGURATION for details.

NOTE: The maximum cable length between any two pieces of equipment is 250'.

Typical Bench Feeder Connection:

Control cable is connected from the Power Wave 455 output receptacle to the input receptacle on the back of the Wire Drive.

Typical Boom Feeder Connection:

One control cable is connected from the Power Wave 455 output receptacle to the Control Box input receptacle. A second control cable is connected from the Control Box output receptacle to the input receptacle on the back of the Wire Drive.

Multiple Wire Drive Connection:

For proper multiple wire drive connections and DIP switch settings contact the Lincoln Electric Company, Customer Service Department. 1-800-833-WELD.

Non-Typical Boom Feeder Connection:

One control cable is connected from the Power Wave 455 output receptacle to the the input receptacle on the back of the Wire Drive. A second control cable is connected from the output receptacle on the back of the Wire Drive to the Control Box input receptacle.

Control Box Mounted on Power Wave 455:

One control cable is connected from the Power Wave 455 output receptacle to the input receptacle on the back of the Wire Drive.

See CONTROL AND ELECTRODE CABLE INSTALLATION for cable installation instructions.

CONTROL CABLE SPECIFICATIONS

It is recommended that only genuine Lincoln control cables be used at all times. Lincoln cables are specifically designed for the communication and power needs of the Power Wave 455 / Power Feed system. The use of non-standard cables, especially in lengths greater than 25 feet(7.6 meters), can lead to communication problems (system shutdowns), poor motor acceleration (poor arc starting) and low wire driving force (wire feeding problems).
Lincoln control cables are copper 5 conductor cable in a SO-type rubber jacket. There is one 20 gauge twisted pair for network communications. This pair has an impedance of approximately 120 ohms and a propagation delay per foot of less than 2.1 nanoseconds. There are two 12 gauge conductors that are used to supply the 40 VDC to the network. The fifth wire is 18 gauge and is used as an electrode sense lead.

AVAILABLE CABLE ASSEMBLIES

K1543 Control cable only. Available in lengths of 8'(2.4m), 16'(4.9m), 25'(7.6m), 50'(15.2m) and 100'(30.5m).

K1544 Control cable and a 3/0 (85 mm2) electrode cable with stud terminal. It is rated at 600 amps, 60% duty cycle and is available in lengths of 8'(2.4m), 16'(4.9m), 25'(7.6m), 50'(15.2m).

K1545 Control cable and a 3/0 (85 mm2) electrode cable with Twist-Mate™ connector on one end and a stud terminal on the other. It is rated at 500 amps, 60% duty cycle and is available in lengths of 8'(2.4m), 16'(4.9m), 25'(7.6m), 50'(15.2m).

ELECTRODE CABLE CONNECTIONS

Most welding applications run with the electrode being positive (+). For those applications, connect the electrode cable between the wire feeder and the positive (+) output stud on the power source (located beneath the spring loaded output cover near the bottom of the case front).

For positive porosity application, a work lead must be run from the negative (-) power source output stud to the work piece. The work piece connection must be firm and secure, especially if pulse welding is planned. Excessive voltage drops at the work piece connection often result in unsatisfactory pulse welding performance.

When negative electrode polarity is required, such as in some Innershield™ applications, install as above, except reverse the output connections at the power source (electrode cable to the negative (-) stud, and work cable to the positive (+) stud).

Change electrode polarity Dip Switch in Feed Head, (see Dip Switch Setup Section).

Connect the one end of the electrode cable, to the power source output terminal of the desired polarity. Connect the other end of the electrode cable to the connection bar at the front of the wire drive feed plate using the provided bolt and lockwasher. The electrode cable lug must be against the feed plate. Be sure the cable, connection bar, and gun adapter bushing all make tight metal-to-metal electrical contact. The Electrode cable should be sized according to the specifications given in the work cable connections section.

WORK CABLE CONNECTIONS

Connect a work lead of sufficient size and length (per the following table) between the proper output terminal on the power source and the work. Be sure the connection to the work makes tight metal-to-metal electrical contact.

To avoid interference problems with other equipment and to achieve the best possible operation, route all cables directly to the work or wire feeder. Avoid excessive lengths, bundle the electrode and ground cables together where practical, and do not coil excess cable.

Minimum work and electrode cables sizes are as follows:

Current 60% Duty Cycle	Minimum Copper Work Cable Size, AWG
	Up to 100 ft Length (30m)
400 Amps	2/0 (67 mm^2)
500 Amps	3/0 (85 mm^2)
600 Amps	3/0 (85 mm^2)

When using an inverter type power source, use the largest welding (electrode and ground) cables that are practical. At least 2/0 copper wire — even if the average output current would not normally require it. When pulsing, the pulse current can reach very high levels. Voltage drops can become excessive, leading to poor welding characteristics, if undersized welding cables are used.

WIRE DRIVE GEAR RATIO (HIGH OR LOW SPEED)

The speed range capability and drive torque of the Power Feed 10 wire drive can be easily and quickly changed by changing the external drive gear. The Power Feed 10 is shipped with both a high speed and a low speed gear. As shipped from the factory, the low speed (high torque) gear is installed on the feeder. If this is the desired gear ratio, no changes need to be made.

SELECTING THE PROPER GEAR RATIO

See the Technical Specifications at the front of this section for feed speed and wire size capabilities with high and low speed gear ratios. To determine whether you should be using the high or low speed ratio use the following guidelines:

- If you need to operate at wire feed speeds above 800 IPM (20 m/m), you will need to install the high speed gear (large 30 tooth, 1.6 inch(41mm) diameter gear).

- If you do not need to run at wire feed speeds in excess of 800 IPM (20 m/m), you should use the low speed gear (small, 20 tooth, 1.1 inch(28mm) diameter gear). Using the low speed ratio will provide the maximum available wire driving force.

Note: If you are feeding only small diameter wires you may, at your option, install the high speed ratio.

CHANGING THE WIRE DRIVE RATIO

Changing the ratio requires a gear change and a PC board switch change. The Power Feed 10 is shipped with both a high speed and a low speed gear. As shipped from the factory, the low speed (high torque) gear is installed on the feeder. For identification purposes, the low speed (high torque) gear has 20 teeth and is 1.1 inches(28mm) in diameter. The high speed gear has 30 teeth and is 1.6 inches(41mm) in diameter.

⚠ WARNING

Power down the Power Feed by turning off its companion Power Wave power source. For maximum safety, disconnect the control cable from the Power Feed.

RATIO CHANGE PROCEDURE:

1) Pull open the Pressure Door.

2) Remove the Phillips head screw retaining the pinion gear to be changed and remove the gear. If the gear is not easily accessible or difficult to remove, remove the feed plate from the gearbox.

To remove feed plate:

a) Loosen the clamping collar screw using a 3/16" Allen wrench. The clamping collar screw is accessed from the bottom of the feed plate. It is the screw which is perpendicular to the feeding direction.

b) Loosen the retaining screw, which is also accessed from bottom of feeder, using a 3/16" Allen wrench. Continue to loosen the screw until the feed plate can be easily pulled off of the wire feeder.

3) Loosen, but do not remove, the screw on the lower right face of the feed plate with a 3/16" Allen wrench.

4) Remove the screw on the left face of the feed plate. If changing from high speed (larger gear) to low speed (smaller gear), line the lower hole on the left face of the feed plate with the threads on the clamping collar. Line the upper hole with the threads to install larger gear for high speed feeder. If feed plate does not rotate to allow holes to line up, further loosen the screw on right face of feed plate.

5) Remove the small gear from the output shaft. Lightly cover the output shaft with engine oil or equivalent. Install gear onto output shaft and secure with flat washer, lock washer, and Phillips head screw which were previously removed.

6) Tighten the screw on lower right face of feed plate.

7) Re-attach feed plate to wire feeder if removed in Step 2.

8) Feed plate will be rotated out-of-position due to the gear change. Adjust the angle of the feed plate per the instructions above.

9) Set the High/Low switch code on Wire Drive PC board as follows:

   a) Remove the cover from the back of the feed head (2 screws).

   b) Locate the 8-position DIP switch near the top edge of the PC board, centered left to right. The setting will be made on the right most switch, S8.

   c) Using a pencil or other small object, slide the switch down, to the "0" position, when the low speed gear is installed. Conversely, slide the switch up, to the "1" position, when the high speed gear is installed. Refer to Figure A.3.

   d) Replace the cover and screws. The PC board will "read" the switch at power up, automatically adjusting all control parameters for the speed range selected.

DIP SWITCH SETUP

SETTING DIP SWITCHES IN THE CONTROL BOX

There are two DIP switch banks on the mother board of the Control Box. They are labeled S1 and S2 and are located and oriented as shown in Figure A.3.

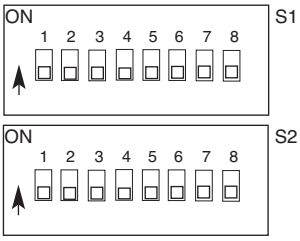


FIGURE A.3

S2 DIP Switch Bank on Control Box Motherboard (For software version S24004-2 only)		
Switch	Off	On
1	Network Group ID, MSB (Assigns Control Box to a specific group) (Off is factory setting)	
2	Network Group ID, LSB (Assigns Control Box to a specific group) (Off is factory setting)	
3	Spare	
4	Spare	
5	Spare	
6	Spare	
7	Spare	
8	Reserved	

S1 DIP Switch Bank on Control Box Motherboard (For software version S24004-3 & up)		
Switch	Off	On
1	Standard speed gearbox limits adjustable	High speed gearbox limits adjustable
2	WFS Display = inches/minute	WFS Display = meters/minute
3	Left Display is always preset WFS	Left Display is preset WFS when weld current is not flowing Left Display is actual weld current when weld current is flowing
	CC modes override this switch regardless of position. Left Display is always preset weld current when weld current is not flowing and actual weld current when weld current is flowing	
4	Run-in = Minimum Speed Available	Run-in = weld WFS
	If any option containing a Run-in setting is connected to the motherboard, it automatically overrides this switch regardless of position.	
5	Memory change with trigger disabled	Memory change with trigger enabled
6	Acceleration, MSB (Sets acceleration rate for wire drive) see below	
7	Acceleration (Sets acceleration rate for wire drive) see below	
8	Acceleration, LSB (Sets acceleration rate for wire drive) see below	

Note: the factory shipped settings for all of the S1 and S2 switches is “OFF”.

S2 DIP Switch Bank on Control Box Motherboard (For software version S24004-3 & up)		
Switch	Off	On
1	Network Group ID, MSB (Assigns Control Box to a specific group) (Off is factory setting)	
2	Network Group ID, LSB (Assigns Control Box to a specific group) (Off is factory setting)	
3	Spare	
4	Spare	
5	Spare	
6	Must be off for normal operation	Adjust lower limits
7	Must be off for normal operation	Adjust upper limits
8	Must be on for European units only	

S1 DIP Switch Bank on Control Box Motherboard (For software version S24004-2 only)		
Switch	Off	On
1	US 4-Step Trigger Logic	Euro 4-Step Trigger Logic
2	WFS Display = inches/minute	WFS Display = meters/minute
3	Left Display is always preset WFS	Left Display is preset WFS when weld current is not flowing Left Display is actual weld current when weld current is flowing
	CC modes override this switch regardless of position. Left Display is always preset weld current when weld current is not flowing and actual weld current when weld current is flowing	
4	Run-in = Minimum Speed Available	Run-in = weld WFS
	If any option containing a Run-in setting is connected to the motherboard, it automatically overrides this switch regardless of position.	
5	Spare	
6	Acceleration, MSB (Sets acceleration rate for wire drive) see below	
7	Acceleration (Sets acceleration rate for wire drive) see below	
8	Acceleration, LSB (Sets acceleration rate for wire drive) see below	

Note: the factory shipped settings for all of the S1 and S2 switches is “OFF”.

MSB - Most Significant Bit or Byte. This is the bit in a binary number or DIP switch bank that is furthest to the left.
LSB - Least Significant Bit or Byte. This is the bit in a binary number or DIP switch bank that is furthest to the right.

S1 DIP Switch Bank on Control Box Motherboard (For software version S24456)		
Switch	Off	On
1	Standard speed gearbox limits adjustable	High speed gearbox limits adjustable
2	WFS Display = inches/minute	WFS Display = meters/minute
3	Left Display is always preset WFS	Left Display is preset WFS when weld current is not flowing Left Display is actual weld current when weld current is flowing
	CC modes override this switch regardless of position. Left Display is always preset weld current when weld current is not flowing and actual weld current when weld current is flowing	
4	Run-in = Minimum Speed Available	Run-in = weld WFS
	If any option containing a Run-in setting is connected to the motherboard, it automatically overrides this switch regardless of position.	
5	Memory change with trigger disabled	Memory change with trigger enabled
6	Acceleration, MSB (Sets acceleration rate for wire drive) see below	
7	Acceleration (Sets acceleration rate for wire drive) see below	
8	Acceleration, LSB (Sets acceleration rate for wire drive) see below	

Note: the factory shipped settings for the S1 switches are as follows:
PF-10 (and Dual) Domestic - All switches “OFF” PF-10 (and Dual) European - switches 1 & 3-8 “OFF”, 2 “ON”
PF-11 Domestic - switches 2-8 “OFF”, 1 “ON” PF-11 European - switches 3-8 “OFF”, 1,2 “ON”

S2 DIP Switch Bank on Control Box Motherboard (For software version S24456)		
Switch	Off	On
1	Network Group ID, MSB (Assigns Control Box to a specific group) (Off is factory setting)	
2	Network Group ID, LSB (Assigns Control Box to a specific group) (Off is factory setting)	
3	4-Step Domestic Configuration	4-Step European Configuration
4	Power Feed 10 / Dual	Power Feed 11
5	Procedure Change with Trigger “OFF”	Procedure Change with Trigger “ON”
6	Set lower limits	
7	Set upper limits	
8	Must be on for all units (Permits selection of extended modes)	

Note: the factory shipped settings for the S2 switches are as follows:
PF-10 (and Dual) Domestic - switches 1-7 “OFF”, 8 “ON” PF-10 (and Dual) European - switches 1,2,4-7 “OFF”, 3,8 “ON”
PF-11 Domestic - switches 1-3,5-7 “OFF”, 4,8 “ON” PF-11 European - switches 1,2,5-7 “OFF”, 3,4,8 “ON”

MSB - Most Significant Bit or Byte. This is the bit in a binary number or DIP switch bank that is furthest to the left.
LSB - Least Significant Bit or Byte. This is the bit in a binary number or DIP switch bank that is furthest to the right.

Setting Wire Drive Acceleration Rate Using DIP Switch S1 on the Control Box Motherboard			(All software versions)
	DIP SWITCH 6	DIP SWITCH 7	DIP SWITCH 8
Acceleration 1 (slow)	Off	Off	On
Acceleration 2	Off	On	Off
Acceleration 3	Off	On	On
Acceleration 4	On	Off	Off
Acceleration 5 (fast) (factory setting)	Off	Off	Off

SETTING DIP SWITCHES IN THE WIRE DRIVE

There is one DIP switch bank on the control board of the wire drive. It's labeled S1 and is located and oriented as shown in Figure A.4.

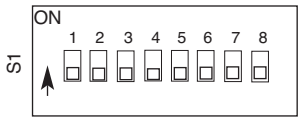


FIGURE A.4

S1 DIP Switch on Wire Drive Control Board (For software version S24029-All & S24467)		
Switch	Off	On
1	Network Group ID, MSB (Assigns Wire Drive to a specific group)	
2	Network Group ID, LSB (Assigns Wire Drive to a specific group)	
3	Network Feed Head ID, MSB (Assigns feed head number to wire drive)	
4	Network Feed Head ID (Assigns feed head number to wire drive)	
5	Network Feed Head ID, LSB (Assigns feed head number to wire drive)	
6	Spare	
7	Electrode Sense Polarity = Positive	Electrode Sense Polarity = Negative
	Switch position must match polarity of weld cable attached to feed plate.	
8	Gear Box Ratio = Low	Gear Box Ratio = High
	Switch position must match actual gear box ratio of wire drive.	

Note: the factory shipped settings for all of the S1 switches is "OFF".

WIRE FEED DRIVE ROLL KITS

NOTE: The maximum rated solid and cored wire sizes and selected drive ratios are shown on the SPECIFICATIONS in the front of this section.

The electrode sizes that can be fed with each roll and guide tube are stenciled on each part. Check the kit for proper components. Kit specifications can be found in the ACCESSORIES section.

PROCEDURE TO INSTALL DRIVE ROLLS AND WIRE GUIDES

⚠ WARNING

ELECTRIC SHOCK can kill.

- **Do not touch electrically live parts such as output terminals or internal wiring.**
- **When feeding without Power Feed 10 "Cold Feed" feature, electrode and drive mechanism are "hot" to work and ground and could remain energized several seconds after the gun trigger is released.**
- **Turn OFF input power at welding power source before installation or changing drive roll and/or guide tubes.**
- **Welding power source must be connected to system ground per the National Electrical Code or any applicable local codes.**
- **Only qualified personnel should perform this installation.**

Observe all additional Safety Guidelines detailed throughout this manual.

Drive Roll Kit Installation (KP1505-[ ])

1) Turn OFF Welding Power Source.

2) Pull open Pressure Door to expose rolls and wire guides.

3) Remove Outer Wire Guide by turning knurled thumb screws counter-clock-wise to unscrew them from Feedplate.

4) Remove drive rolls, if any are installed, by pulling straight off shaft. Remove inner guide.

5) Insert inner Wire Guide, groove side out, over the two locating pins in the feedplate.

6) Install each drive roll by pushing over shaft until it butts up against locating shoulder on the drive roll shaft. (Do Not exceed maximum wire size rating of the wire drive).

7) Install Outer Wire Guide by sliding over locating pins and tightening in place.

8) Engage upper drive rolls if they are in the "open" position and close Pressure Door.

TO SET DRIVE ROLL PRESSURE, see "Drive Roll Pressure Setting" in OPERATION.

GUN AND CABLE ASSEMBLIES WITH STANDARD CONNECTION

The Power Feed 10 wire feeder is equipped with a factory installed K1500-2 gun connection Kit. This kit is for guns having a Tweco™ #2-#4 connector. The Power Feed 10 has been designed to make connecting a variety of guns easy and inexpensive with the K1500 series of gun connection kits. Gun trigger and dual procedure lead connections connect to the single 5 pin receptacle on the front of the feed head box. See "Gun Adapters" in ACCESSORIES section.

GUN AND CABLE ASSEMBLIES WITH FAST-MATE™ CONNECTION
(including the Magnum 450 Water Cooled gun)

A K489-7 adapter will install directly into the wire drive feedplate, to provide for use of guns with Fast-Mate™ or European style gun connections. This K489-7 will handle both standard Fast-Mate™and Dual Schedule Fast-Mate™ guns.

Another way to connect a gun with a Fast-Mate™ or European style gun connector to the Power Feed 10, is to use the K489-2 Fast-Mate™ adapter kit. Installation of this adapter also requires a K1500-1 gun connector. See "Gun Adapters" in ACCESSORIES section.

Magnum 200 / 300 / 400 Guns

The easiest and least expensive way to use Magnum 200/300/400 guns with the Power Feed 10 wire feeder is to order them with the K466-10 connector kit, or to buy a completely assembled Magnum gun having the K466-10 connector (such as the K497-21 dedicated Magnum 400).

Magnum 550 Guns

The easiest and least expensive way to use the Magnum 550 guns with Power Feed 10 wire feeders is to order the gun with the K613-7 connector kit, and install a K1500-3 gun connection kit to the wire feeder.

Lincoln Innershield and Sub Arc Guns

All of these guns can be connected to the Power Feed by using the K1500-1 Adapter Kit.

Lincoln Fume Extraction Guns

The K556 (250XA) and K566 (400XA) guns require that a K489-2 Fast-Mate™ adapter kit be installed. Installation of this adapter also requires a K1500-1 gun connector kit.

The K206, K289, and K309 require only the installation of a K1500-1 connector in the Power Feed wire feeder.

Non-Lincoln Guns

Most competitive guns can be connected to the Power Feed by using one of the K1500 series adapter kits, See “Gun Adapters” in ACCESSORIES section.

GENERAL GUN CONNECTION GUIDELINES

GUN CONNECTIONS - GENERAL

4-roll feed plates are equipped with a brass connector bar at the gun-end of the feed plate to allow a bolted brass-to-brass electrical connection to be made directly to either standard or Fast-mate gun adapter bushings. Use a 1/4 inch allen key on the factory-installed socket head cap screw to insure that the connector bar is securely tightened to the adapter bushing.

The instructions supplied with the gun and K1500 series gun adapter should be followed when installing and configuring a gun. What follows are some general guidelines that are not intended to cover all guns.

a. Turn off input power at welding power source before installation or changing of gun.

b. Check that the drive rolls and guide tubes are proper for the electrode size and type being used. If not, change them.

c. Lay the cable out straight. Insert the connector on the welding conductor cable into the brass conductor block on the front of the wire drive head. Make sure it is all the way in and tighten the hand clamp. Keep this connection clean and bright. Connect the trigger control cable polarized plug into the mating 5 cavity receptacle on the front of the wire drive unit.

Note: for Fast-Mate and European connector style guns, connect gun to gun connector making sure all pins and gas tube line up with appropriate holes in connector. Tighten gun by turning large nut on gun clockwise.

d. For GMA Gun Cables with separate gas fittings, connect the 3/16” I.D. gas hose from the wire drive unit to the gun cable barbed fitting.

e. For water cooled guns see WATER CONNECTIONS in this section.

GMAW SHIELDING GAS

⚠ WARNING

CYLINDER may explode if damaged.

- Keep cylinder upright and chained to support.
- Keep cylinder away from areas where it may be damaged.
- Never lift welder with cylinder attached.
- Never allow welding electrode to touch cylinder.
- Keep cylinder away from welding or other live electrical circuits.

BUILDUP OF SHIELDING GAS may harm health or kill.

- Shut off shielding gas supply when not in use.

SEE AMERICAN NATIONAL STANDARD Z-49.1, "SAFETY IN WELDING AND CUTTING" PUBLISHED BY THE AMERICAN WELDING SOCIETY.

Customer must provide a cylinder of shielding gas, a pressure regulator, a flow control valve, and a hose from the flow valve to the gas inlet fitting of the wire drive unit.

Connect a supply hose from the gas cylinder flow valve outlet to the 5/8-18 female inert gas fitting on the back panel of the wire drive or, if used, on the inlet of the Gas Guard regulator. (See Below).

Gas Guard Regulator - The Gas Guard Regulator is an optional accessory (K659-1) on these models.

Install the 5/8-18 male outlet of the regulator to the 5/8-18 female gas inlet on the back panel of the wire drive. Secure fitting with flow adjuster key at top. Attach gas supply to 5/8-18 female inlet of regulator per instructions above.

WIRE SPINDLE PLACEMENT

The reel stand provides two mounting locations for the 2 inch diameter wire reel spindle to accommodate various reel sizes. Each mounting location consists of a tube in the center of the reel stand, and locating slots on the outside of the reel stand. The bolt, used with a plain washer and lock washer, slides through the tube from the side of the reel stand. The bolt should be threaded into the wire spindle such that the tabs on the brake mechanism align with the locating slots, then tighten.

The upper location must be used for 50-60 lb. Readi-Reels, Spools and Coils.

For smaller coils (44lb, 30lb, 10lb, etc.), the spindle can be placed in either the upper or lower location. The goal is to make the wire path from the coil to the wire drive an entry into the incoming guide tube that is as straight as possible. This will optimize wire feeding performance.

WATER CONNECTIONS (FOR WATER COOLED GUNS)

If a water cooled gun is to be installed for use with the Power Drive 10, a K590-5 Water connection kit can be installed. Contained in the kit are the water lines and quick connect water line fittings that install in the wire feed head. Follow the installation instructions included in the kit. Water cooled guns can be damaged very quickly if they are used even momentarily without water flowing. To protect the gun, we recommended that a water flow sense kit be installed. This will prevent wire feeding if no water flow is present.

WIRE FEED SHUT DOWN CIRCUIT (OPTIONAL)

This circuit is intended to be used as a means of stopping wire feeding in the event that the water cooler (for a water cooled gun) is not turned on. Water cooled guns can be damaged very quickly if they are used even momentarily without water flowing. A Lincoln K1536-1 flow sensor kit is available for this purpose.

The K1536-1 has two control leads coming from the unit that become electrically common when water is flowing. The .25 inch tab terminals of leads 570 and 572, inside the feed head case, are disconnected from each other. Then the flow sensor control wires are connected to leads 570 and 572. Refer to the instructions that come with flow sensor kit for detailed installation instructions.

OPTIONAL FEATURES INSTALLATION

A number of Optional Features are available for use with Power Feed 10. Some Installation information is provided in this section, REFER TO THE INSTRUCTIONS THAT COME WITH EACH KIT FOR DETAILED INFORMATION REGARDING INSTALLATION.

OPTIONAL PANELS FOR CONTROL BOX

All optional panels for the control box are described in the ACCESSORIES section of this manual along with their installation instructions as are all other pieces of optional equipment.

The PF-10 Control Box is designed to accept three control panels, two 'large' and one "small" panels are needed to make up a complete control panel for the Control Box. Panels can be mounted in one of three positions: Upper, middle and lower.

Each Control Box is shipped with a Control/Display (CD) panel, a large panel, installed in the upper position, and a CV/Gouge (CV/G) panel (another large panel) in the lower position. The middle position is filled with a blank panel.

The CD panel must be installed in every Control Box. The small panel can be blank, it can be a Dual Procedure panel, or a Dual Procedure Memory panel. The remaining large panel can be one of the following: CV/G, M, MX2, or MSP2. The features of each are described in the Operation section of this manual.

There are extra mounting holes in the upper and middle positions which allow the upper two panels to be interchanged. (Instead of the upper, middle and lower panels being large, small and large, they could be installed in the order small, large, large.) This may be done for convenience sake, or to take advantage of the Large Security Door option.

Note: The CD panel must be installed in either the middle or the upper position; its harness is not long enough to allow installation in the lower position.

GENERAL PANEL INSTALLATION GUIDELINES:

Installation or removal of any panel can be done with only a Phillips screwdriver after the system power is turned off. To remove a panel, remove the two screws holding it in place, remove the push-on chassis ground wire and remove the harness connection to the Control Box main PC board. To install any panel, reverse that process. Turn power back on when complete (option panels are only recognized at power up. Do not install panels with the power on.) Note that removal or installation of any panel may also require the removal of the other panel, in order to have easy access to the PC board connectors. Detailed installation instructions are shipped with each option panel.

BOOM AND BENCH CONVERSIONS

The modular design of these feeders allows them to be converted from bench to boom models or vise versa. Some additional parts are required to make this conversion.

Materials Required for bench to boom conversion:

K1548-1 Linc-Net receptacles, installs in control box.

K1543-"Length" Linc-Net Control Cable, Control cable between control box and wire drive.

Materials Required for boom to bench conversion:

L10286-1 Wire Reel Stand.

SAFETY PRECAUTIONS

⚠ WARNING

ELECTRIC SHOCK can kill.

- **Do not touch electrically live parts such as output terminals or internal wiring.**
- **When inching with gun trigger, electrode and drive mechanism are "hot" to work and ground and could remain energized several seconds after the gun trigger is released.**
- **Turn OFF input power at welding power source before installation or changing drive roll and/or guide tubes.**
- **Welding power source must be connected to system ground per the National Electrical Code or any applicable local codes.**
- **Only qualified personnel should perform this installation.**

Observe all additional Safety Guidelines detailed throughout this manual.

PRODUCT DESCRIPTION

The Power Feed 10 is a high performance, digitally controlled, modular wire feeder. Properly equipped, it can support the GMAW, GMAW-P, FCAW, and SMAW processes. The Power Feed wire feeders are designed to be a part of a modular, multi process welding system.

The Power Feed 10 is a 4 driven roll feeder that operates on 40VDC input power. .

The Power Feed wire feeders are designed to be used with Power Feed compatible power sources, operating as a system. Each component in the system has special circuitry to "talk with" the other system components, so each component (power source, wire feeder, electrical accessories) knows what the other is doing at all times. This shared information lays the groundwork for a system with superior welding performance.

The Power Feed 10 is available configured in both boom and bench models. In addition, the Control Box and wire feed unit can also be purchased separately. The bench model is designed so that it can easily be converted to a boom feeder.

RECOMMENDED PROCESSES AND EQUIPMENT

RECOMMENDED PROCESSES

The Power Feed 10 can be set up in a number of configurations. It is designed to be used for GMAW, GMAW-P, FCAW, and SMAW for a variety of materials, including mild steel, stainless steel, and cored wires.

RECOMMENDED EQUIPMENT

The Power Feed 10 must be used with power sources having digital communication capabilities and 40 VDC auxiliary power. The presently available power source is the PowerWave 455.

DUTY CYCLE

The Power Feed 10 wire feeder is capable of welding at a 100% duty cycle (continuous welding). The power source will be the limiting factor in determining system duty cycle capability.

CONTROL BOX OPERATION

The most frequently used Control Box controls and settings are external; some features are accessed by internal controls and settings.

CONTROL BOX PANELS - UPPER PANEL

CONTROL/DISPLAY PANEL: (REQUIRED)

Each PF-10 Control box must have a Control/Display (CD) panel. This panel consists of adjustment knobs, digital displays and a series of indicator lights (LEDs). There are two knobs; each has a 4 digit LED display and a pair of LEDs associated with it. Knobs and displays have dual functions; the LEDs indicate which function at any given time. This panel also has a dual color Status LED, used to indicate the general health status of the Control Box and its connection to other components in the system (power source, wire drive, etc.).

The left knob/display is labeled WFS / AMPS (wire feed speed/amps). In non-synergic modes, the WFS control changes the wire feed speed according to the desired procedure. In synergic welding modes (synergic CV, pulse GMAW) WFS is the dominant control parameter, controlling all other variables.

The user adjusts WFS according to factors such as weld size, penetration requirements, heat input, etc. The power source then uses the WFS setting to adjust its output characteristics (output voltage, output current) according to pre-programmed settings contained in the power source. In constant current modes (arc gouging, stick, TIG) this control adjusts the output current, in amps. An LED lights to inform the user which function (WFS or amps) is active.This display can be either English or metric units. Further, this display can be set up to display either WFS or amps when using wire welding modes. (See SETTING DIP SWITCHES in the INSTALLATION section.)

The right knob is labeled VOLTS / TRIM. In constant voltage modes (synergic CV, standard CV) the control adjusts the welding voltage. In pulse synergic welding modes (pulse GMAW only) the user can change the Trim setting to adjust the arc length. It is adjustable from 0.50 to 1.50. A Trim setting of 1.00 means than no adjustments will be made to the preset arc lengths, and is optimum for most conditions. An LED lights to inform the user which function (volts or trim) is active.

Both displays indicate preset values, according to the weld mode selected, when not welding. Once welding begins, they switch to displaying actual values. At that time, the indicator LEDs will flash to signify actual values are being displayed. The displays hold the actual values for 5 seconds after a weld is stopped. Turning a knob during the hold time shuts off the hold, and returns the meters to their preset values.

The allowable settings are determined by other system components. The WFS range, for instance, is dependent upon the gear range in the Wire Drive and on the welding programs in the Power Wave power source. The voltage and current are similarly limited by programs in the Power Wave.

CONTROL BOX PANELS - "SMALL" OPTIONAL PANELS

K1542-5 Dual Procedure Panel:

This panel provides for setting and manual selection of two procedures with a toggle switch. Selection can be done at the panel, or through a dual procedure welding gun switch connected to the Wire Drive trigger receptacle. The upper position selects Procedure A, while the lower selects Procedure B. The middle position selects the Gun Switch, in which case the procedure is determined by the dual procedure welding gun switch. Note: When in the Gun Switch mode, this option does not have provisions for indicating which remotely selected procedure (A or B) is active.

To set Procedure A, move the switch to the A position. Make all desired settings on the Control Box. Settings are automatically saved as changes are made. Do the same for procedure B. If using a gun switch to select procedures, set the switch to Gun Switch. Procedure A is the default if no gun switch is present. Settings are saved at power down.

K1542-9 Dual Procedure / Memory Panel:

This panel provides two functions: Dual Procedure and Memory. Dual Procedure provides for setting and manual selection of two procedures. Selection can be done at the panel, or through a dual procedure welding gun switch connected to the Wire Drive trigger receptacle. Memory provides six independent storage locations for Control Box settings. All selections are done with push buttons and indicator lights. Dual Procedure can be used without making use of Memories; the opposite is also true.

To set Procedure A, hit the Procedure button until the A LED illuminates. Make all desired settings on the Control Box. Settings are automatically saved as changes are made. Do the same for procedure B. If using a gun switch to select procedures, hit the Procedure button until the Gun LED illuminates. When in the Gun mode is selected, either light A or B will be flashing. The flashing light identifies the Procedure, A or B, which is selected by a dual procedure gun switch. If no dual procedure switch is plugged in, the Procedure defaults to A. Settings are saved at power down.

To load a memory, start by setting all adjustments and functions on the Power Feed to the desired settings. To save the settings to Memory 1, simply hit the Save button (its red light will illuminate) and then hit the 1 button. The settings are now saved in Memory 1. The contents of Memory 1 will not change, even if the power is turned off, until the next time the Save key and the 1 key are hit in sequence. The same procedure can be applied to each of the other 5 memories. If the Save key is hit accidentally, simply hit the Save button again, its light will go out, and the Save function will be canceled.

Note: It is not required to load all 6 memories at once, nor is it necessary to load them in order. Memory can be loaded at any time, except when welding. Similarly, the Save key is not active while the gun trigger is pulled, or while welding.

Memory has an advanced feature called 'memory reminder'. When the Save key is hit, the memory reminder function flashes the LED of the most recently used memory, so the operator can save procedures in the most recently used memory if desired. It is not necessary to save to the most recently used memory; the memory reminder function, and it's flashing LED, can be ignored.

Memories cannot be changed without using the Save key. When slight procedure adjustments are necessary, but there is no desire to 'permanently' save the adjustments to a memory, this can be done with Procedure A and Procedure B. Set the Panel to A or B, and recall a memory setting. Make the slight procedure adjustment -- it will be saved in A or B, whichever was selected when the adjustments were made. The memory location will not have changed.

To recall a memory setting, simply push that memory button. That memory's contents will be immediately recalled to the Control box.

If the 'Memory Change with Trigger Pull' DIP switch is on (see SETTING DIP SWITCHES in the INSTALLATION section) it is possible to recall a given memory by quickly pulling and releasing the gun trigger before welding. To switch to memory 'n', simply pull and release the gun trigger 'n' times without attempting to weld. The trigger pulls and releases must be done quickly, in rapid succession. If too much time is allowed to pass, the memory location will not change. Note that whenever the trigger is pulled, a welding sequence (preflow, run in, etc.) begins, so the electrode should not be allowed to contact the work piece.

CONTROL BOX PANELS -- 'LARGE' OPTION PANELS

A description of the set up controls, Preflow, Run In, Arc Control, Postflow, and Crater, and their maximum and minimum values, is in CONTROL BOX PANELS - SET UP CONTROLS DESCRIPTION in this section.

CV/Gouge Panel:(Std.)

The CV/G Panel has a single toggle switch for selecting between two weld modes: CV welding and arc gouging. All other set up parameters, Preflow, Arc Control, Postflow, and Crater, default to zero or off. Run-in defaults to the minimum value, or to the weld speed depending on the position of its associated dip switch. (See SETTING DIP SWITCHES in the INSTALLATION section.) Burn back defaults to the on-board trimmer adjustment. When used with the Dual Procedure or Memory options, only the WFS/Amps and Volts/Trim settings are saved.

Selecting the Gouge mode immediately energizes the output terminals on the power source. The output current is set by the Amps control. The Volts/Trim adjustment has no effect in this mode.

K1542-6 M Panel:

This panel has a three position toggle switch for selecting one of three weld modes: CV/MIG, CV/Flux Cored and CC/Stick/Gouge, and a single knob for adjustment of Arc Control. All other set up parameters, Preflow, Postflow, and Crater, default to zero or off. Run-in defaults to the minimum value, or to the weld speed depending on the position of its associated dip switch. (See SETTING DIP SWITCHES in the INSTALLATION section.) Burn back defaults to the on-board trimmer adjustment. When used with the Dual Procedure or Memory options, only the WFS/Amps and Volts/Trim settings are saved.

Selecting the CC/Stick/Gouge mode immediately energizes the output terminals on the power source. The output current is set by the Amps control. The Volts/Trim adjustment has no effect in this mode.

K1542-11 MX2 Panel:

This panel provides a selection of four weld modes: CV/MIG, CV/Flux Cored, CC/Stick/soft and CC/Stick/Crisp through a toggle switch and indicator lights (LEDs). It allows for adjustment of all set up parameters, Preflow, Run In, Arc Control, Burnback, Postflow, and Crater, through an up/down toggle switch, indicator lights and a 3 digit display.

Weld modes are selected with the Mode Select switch, an up/down center-off momentary toggle switch. Moving the switch bat up or down moves the Weld Mode LED in the corresponding direction. Holding the switch in either direction will cause the indicator to move quickly in the corresponding direction until the switch is released, or the upper or lower limit is reached.

To adjust Set Up parameters, first select the Set Up parameter for adjustment, and then adjust the displayed value up or down.

Set Up parameters are selected with the Select switch, an up/down center-off momentary toggle switch. Moving the switch bat up or down moves the Weld Mode LED in the corresponding direction. Holding the switch in either direction will cause the indicator to move quickly in the corresponding direction until the switch is released, or the upper or lower limit is reached.

The value of the active Set Up parameter, as defined by the Set Up LED, is displayed on the MX2 panel Set Up display. The value can be modified with the Set switch. The Set switch is an up/down center-off momentary toggle switch. Moving the switch bat up or down adjusts the displayed value in the corresponding direction. Holding the switch in either direction will cause the display to move quickly in the corresponding direction until the switch is released, or the upper or lower parameter limit is reached.

To energize the output studs in either CC/Stick mode, the right Control/Display panel knob, labeled Volts/Trim, must be used. The Volts/Trim knob must be turned clockwise roughly a quarter revolution to energize the output studs. (The Volts/trim display will indicate 'On' when the studs are energized.) Similarly, turning the knob a quarter turn counter-clockwise de-energizes the output studs. If a CC/Stick weld mode is entered through use of the Dual Procedure, the studs will be in the same state as when they were last used. If a CC/Stick weld mode is entered through a Memory recall, the studs will be de-energized.

K1542-12 MSP2 Panel:

This panel provides a selection of over 25 weld modes, including CV, pulse, FCAW and CC, through a toggle switch and indicator lights (LEDs). It allows for adjustment of all set up parameters, Preflow, Run In, Arc Control, Burnback, Postflow, and Crater, through an up/down toggle switch, indicator lights and a 3 digit display.

To adjust a set up parameter (Weld Mode being one of those parameters), first select one of the set up parameters for adjustment, and then adjust the displayed value up or down.

Set up parameters are selected with the Select switch, an up/down center-off momentary toggle switch. Moving the switch bat up or down moves an LED in the corresponding direction. Holding the switch in either direction will cause the indicator to move quickly in the corresponding direction until the switch is released, or the upper or lower limit is reached.

The value of the active set up parameter is shown on the MSP2 panel digital display. The value can be modified with the Set switch. The Set switch is an up/down center-off momentary toggle switch. Moving the switch bat up or down adjusts the displayed value in the corresponding direction. Holding the switch in either direction will cause the display to move quickly in the corresponding direction until the switch is released, or the upper or lower parameter limit is reached.

To energize the output studs in either CC/Stick mode, the right Control/Display panel knob, labeled Volts/Trim, must be used. The Volts/Trim knob must be turned clockwise roughly a quarter revolution to energize the output studs. (The Volts/trim display will indicate 'On' when the studs are energized.) Similarly, turning the knob a quarter turn counter-clockwise de-energizes the output studs. If a CC/Stick weld mode is entered through use of the Dual Procedure, the studs will be in the same state as when they were last used. If a CC/Stick weld mode is entered through a Memory recall, the studs will be de-energized.

CONTROL BOX PANELS -- SET UP CONTROLS DESCRIPTION

Certain large option panels can modify the set up parameters Preflow, Run In, Arc Control, Burnback, Postflow, and Crater. The meaning of those parameters, and their maximum and minimum values, follows.

Preflow - Time delay after the trigger is pulled, but before weld starts, during which shielding gas flows. Weld start is defined as the time when both the power source is energized and the Wire Drive begins feeding wire. Adjustable from 0.0 (Off) to 2.5 seconds in 0.1s increments.

Run In - Wire feed speed during arc starting. Wire Drive will feed wire at the Run In speed for one second, or until weld current flows. Low speed gear range: Off (Run In speed equals weld wire feed speed) or adjustable from 50 to 150 IPM (1.25 to 3.80 MPM). High speed gear range: Off (Run In speed equals weld wire feed speed) or adjustable from 75 to 150 IPM (2.00 to 3.80 MPM). **NOTE:** Run In settings over 150 IPM produce strange display values used for troubleshooting and service. If encountered, reset Run In to 150 IPM or less.

Arc Control - Unitless characteristic, also known as Inductance or Wave Control. Allows operator to vary the arc characteristics from "soft" to "harsh" in all weld modes. Adjustable from -10.0 to 10.0 in increments of 0.1. Off (0.0) is nominal.

Burnback - Time delay after the trigger is released during which the power source remains energized but the Wire Drive stops feeding wire. Adjustable from 0.00 (Off) to 0.25 seconds in 0.01 second increments.

Postflow - Time delay after burnback is complete, during which shielding gas flows. Adjustable from 0.0 (Off) to 10.0 seconds in 0.1 second increments.

Crater - Used only when welding with the 4-Step trigger mode. Can be set to Off or On. When On, Adjustments can be made to WFS and Volts/Trim on the Control/Display panel. These settings are then used for 'cratering' when in the 4-Step trigger mode (see explanation of 2 Step and 4 Step operation below). When Off, 'cratering' is not possible.

CONTROL BOX -- PC BOARD ADJUSTMENTS

The Control Box Mother board provides the capability to adjust some wire feeding parameters as follows:

Acceleration: The motor acceleration can be varied in five steps, from slow to fast. See "Setting DIP Switches in the Control Box" section.

Burnback: For the options which cannot adjust the Burnback set up parameter (CV/G and M panels) a PC board adjustment (trimmer R5) is provided. The range is 0.0 to 0.25 seconds, increasing in the clockwise direction. This is ignored by options which have the ability to adjust Burnback (MX2 and MSP2 panels).

Run In: For the options which cannot adjust the Run In set up parameter (CV/G and M panels) a PC board DIP switch setting is provided. In one position, the run in speed will be the minimum Wire Drive WFS. At the other setting, run in will occur at the same speed as set on the WFS knob. This DIP switch setting is ignored by options which have the ability to adjust Run In (MX2 and MSP2 panels). See "Setting DIP Switches in the Control Box" section.

CONTROL BOX -- SETTING OPERATING LIMITS

Upper and lower operating limits can be set for the WFS/Amps setting and the Volts/Trim setting. Doing so requires knowledge of how to set the limits, and access to the PC board in the Control Box.

There are two independent sets of limits, Procedure A limits and Procedure B limits. If a DP/M door option is installed, the A and B limits must be set independently. If there is no DP/M door option, the Control Box defaults to Procedure A, and only Procedure A limits can be set.

With system power on, select the weld mode for which you want to set limits. If a Dual Procedure option is installed, select the procedure A. Turn the system power off. Remove the two screws holding the Control/Display panel to the Control Box, but do not unplug it. Tilt the panel down to allow access to DIP switches S1-1, S2-6 and S2-7. (See "Setting DIP Switches in the Control Box" section.) Do not allow the panel to hang by the wiring harness.

Determine if the Wire Drive is set up for low or high speed. If low speed, S1-1 should be off. If high speed, set S1-1 to on.

To adjust the lower limit, set S2-6 to on. Turn the power on and adjust the WFS/Amps and Volts/Trim knobs to the desired lower limits. Note: You will not be able to adjust the lower limit outside of the minimum and maximum wire feed speed of the Wire Drive, nor above the upper limit. Turn the system power off. Return S2-6 to off.

To adjust the upper limit, set S2-7 to on. Turn the power on and adjust the WFS/Amps and Volts/Trim knobs to the desired upper limits. Note: You will not be able to adjust the upper limit outside of the minimum and maximum wire feed speed of the Wire Drive, nor below the lower limit. Turn the system power off. Return S2-7 to off.

If a Dual Procedure panel is installed, repeat the above procedure with the Procedure B selected. When done, attach the Control/Display panel to the Control Box. The machine is now ready for normal operation with the new limits.

CONTROL BOX -- USING OPERATING LIMITS

Once set, limits apply to all weld modes. Limiting Procedure A to 200 to 300 inches per minute, for example, limits the ability of the operator to adjust his WFS in pulse, CV and FCAW weld modes. Limiting the Volts to 23.0 to 24.5 would limit the ability of the operator to adjust his Volts in synergic and non-synergic CV modes. Procedure B could be set up with different limits. Limits are absolute -- they will override values stored in the memories. Note that limits do not apply to set up parameters, such a Preflow and Arc Control.

OPERATION WITH PREVIOUS SOFTWARE VERSION

The operation of the previous Control Box software version (S24004-2) is different than described earlier in this section. The differences are as follows:

- The Memory/Dual Procedure panel is not a valid option.
- The MX (K1542-1) and MSP (K1542-8) are are used in place of the MX2 and MSP2 options.
- Limits cannot be set.

The key difference in the MX/MSP panels, compared to the MX2/MSP2 panels, is the Spot function. In the old software, a 0.1 to 2.5 second Spot function was available on these two panels. No Crater function was available (Crater replaced Spot in the graphics on these two panels).

An upgrade kit is available to change the software from S24004-2 to the latest version of Control Box software. Once the upgrade is done, the Dual Procedure/ Memory panel becomes a valid option, limits can be set, and Spot is replaced by Crater.

WIRE DRIVE OPERATION

The most frequently used Wire Drive settings are external; some features are accessed by internal settings.

WIRE DRIVE SETTINGS -- EXTERNAL

2 STEP / 4 STEP SWITCH:

The Wire Drive has a 2 Step / 4 Step switch located on the gun side of the Status LED. This switch has no effect in CC modes of operation, such as stick welding.

When using 2 Step Logic:

1. Closing the gun trigger initiates the welding sequence (preflow, run in, etc.).
2. Opening the gun trigger ends the arc begins burnback, postflow, etc..

When using 4 Step Logic With Crater Fill “OFF”:

1. Closing the gun trigger initiates the welding sequence (preflow, run in, etc.).
2. Opening the trigger after the welding arc is established allows the weld to continue as long as current flows. If the arc goes out, the 4 step cycle is reset.
3. Closing the trigger again allows the weld to continue.
4. Opening the trigger again ends the arc begins burnback, postflow, etc..

When using 4 Step Logic With Crater Fill “ON”:

1. Closing the gun trigger initiates the welding sequence (preflow, run in, etc.).
2. Opening the trigger after the welding arc is established allows the weld to continue as long as current flows. If the arc goes out, the 4 step cycle is reset.
3. Closing the trigger again changes the wire feed speed and the Volts/Trim to the Crater values, and the weld to continues
4. Opening the trigger again ends the arc begins burnback, postflow, etc..

COLD FEED / GAS PURGE SWITCH:

The Wire Drive has a Cold Feed/Gas Purge Switch located near the gun connector. This is an up/down center-off momentary toggle switch.

When held in the up position, the Wire Drive will feed wire, but neither the power source nor the gas solenoid will be energized. When cold feeding, the feed speed can be adjusted by rotating the WFS encoder knob on the Control Box. Adjusting the cold feed will not affect the run in or welding wire feed speed. When the cold feed switch is released, the cold feed value is saved.

When this switch is held in the down position, the gas solenoid valve is energized, but neither the power source nor the drive motor will be energized.

WIRE DRIVE -- PC BOARD ADJUSTMENTS

ELECTRODE POLARITY:

The system needs to be aware of the electrode polarity. A DIP switch setting on the Wire Drive PC board is used for this purpose. See INSTALLATION Section “Setting DIP Switches in the Wire Drive”.

GEAR BOX RATIO:

The systems needs to know which gear has been installed on the Wire Drive, low or high speed. A DIP switch setting on the Wire Drive PC board is used for this purpose. See INSTALLATION section “Wire Drive Ratio” for information on how to set the DIP Switch.

WIRE REEL LOADING - READI-REELS, SPOOLS OR COILS

To Mount a 30 Lb. (14 kg) Readi-Reel Package (Using the Molded Plastic K363-P Readi-Reel Adapter:)

The Spindle should be located in the **LOWER** mounting hole.

1) Depress the Release Bar on the Retaining Collar and remove it from the spindle. See Figure B.1.

2) Place the Adapter on the spindle.

3) Re-install the Retaining Collar. Make sure that the Release Bar “pops up” and that the collar retainers fully engage the retaining groove on the spindle.

4) Rotate the spindle and adapter so the retaining spring is at the 12 o'clock position.

5) Position the Readi-Reel so that it will rotate in a direction when feeding so as to be de-reeled from bottom of the coil.

6) Set one of the Readi-Reel inside cage wires on the slot in the retaining spring tab.

7) Lower the Readi-Reel to depress the retaining spring and align the other inside cage wires with the grooves in the molded adapter.

8) Slide cage all the way onto the adapter until the retaining spring "pops up" fully.

⚠ CAUTION

Check to be sure the Retaining Spring has fully returned to the locking position and has SECURELY locked the Readi-Reel Cage in place. Retaining Spring must rest on the cage, not the welding electrode.

9) To remove Readi-Reel from Adapter, depress retaining spring tab with thumb while pulling the Readi-Reel cage from the molded adapter with both hands. Do not remove adapter from spindle.

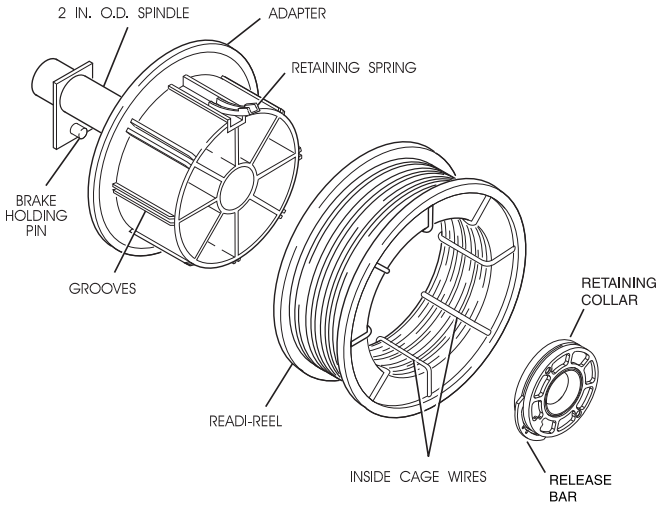


FIGURE B.1

To Mount 10 to 44 Lb. (4.5-20 kg) Spools (12"/300 mm Diameter) or 14Lb.(6 Kg) Innershield Coils:

The Spindle should be located in the **LOWER** mounting hole.

(For 8" (200 mm) spools, a K468 spindle adapter must first be slipped onto spindle.)

(For 13-14 lb. (6 Kg) Innershield coils, a K435 Coil Adapter must be used).

1) Depress the Release Bar on the Retaining Collar and remove it from the spindle.

2) Place the spool on the spindle making certain the spindle brake pin enters one of the holes in the back side of the spool. Be certain the wire comes off the reel in a direction so as to de-reel from the bottom of the coil.

3) Re-install the Retaining Collar. Make sure that the Release Bar "pops up" and that the collar retainers fully engage the retaining groove on the spindle.

To Mount a 50-60 Lb. (22.7-27.2 kg) Coil: (Using K1504-1 Coil Reel) (For 50-60 lb Readi-Reels a K438 Readi-Reel Adapter must be used).

The Spindle must be located in the **UPPER** mounting hole.

1) With the K1504-1 Coil Reel mounted on to the 2" (51 mm) spindle (or with reel laying flat on the floor) loosen the spinner nut and remove the reel cover. See Figure B.2.

2) Before cutting the tie wires, place the coil of electrode on the reel so it unwinds from the bottom as the reel rotates.

3) Tighten the spinner nut against the reel cover as much as possible by hand using the reel cover spokes for leverage. DO NOT hammer on the spinner nut arms.

4) Cut and remove only the tie wire holding the free end of the coil. Hook the free end around the rim of the reel cover and secure it by wrapping it around. Cut and remove the remaining tie wires.

⚠ CAUTION

Always be sure the free end of the coil is securely held while the tie wires are being cut and until the wire is feeding through the drive rolls. Failure to do this will result in "backlashing" of the coil, which may tangle the wire. A tangled coil will not feed so it must either be untangled or discarded.

5) Be sure the coil reel is engaged with the spindle brake pin and the Release Bar on the Retaining Collar "pops up" and that the collar retainers fully engage the retaining groove on the spindle.

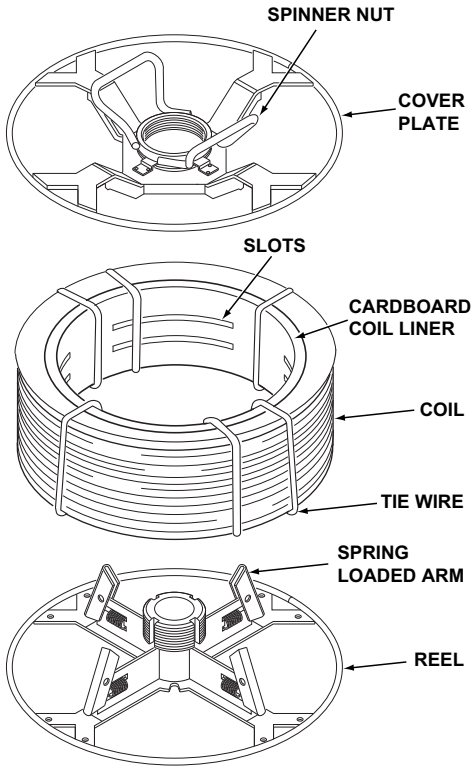


FIGURE B.2

FEEDING ELECTRODE AND BRAKE ADJUSTMENT

1) Turn the Reel or spool until the free end of the electrode is accessible.

2) While tightly holding the electrode, cut off the bent end and straighten the first 6" (150 mm). Cut off the first 1" (25 mm). (If the electrode is not properly straightened, it may not feed or may jam causing a "birdnest".)

3) Insert the free end through the incoming guide tube.

4) Press the Cold Inch key or the Cold Feed Mode gun trigger and push the electrode into the drive roll.

⚠ WARNING

When feeding with the gun trigger, unless "COLD FEED" trigger mode is selected, the electrode and drive mechanism are always "HOT" to work and ground and could remain "HOT" several seconds after the gun trigger is released.

---

5) Feed the electrode through the gun.

6) Adjust the brake tension with the thumbscrew on the spindle hub, until the reel turns freely but with little or no overrun when wire feeding is stopped. Do not overtighten.

DRIVE ROLL PRESSURE SETTING

The Power Feed 10 pressure is factory pre-set to about position "2" as shown on the pressure indicator on the front of the feedplate door. This is an approximate setting.

The optimum drive roll pressure varies with type of wire, surface condition, lubrication, and hardness. Too much pressure could cause "birdnesting", but too little pressure could cause wire feed slippage with load and/or acceleration. The optimum drive roll setting can be determined as follows:

1) Press end of gun against a solid object that is electrically isolated from the welder output and press the gun trigger for several seconds.

2) If the wire "birdnests", jams, or breaks at the drive roll, the drive roll pressure is too great. Back the pressure setting out turn, run new wire through gun, and repeat above steps.

3) If the only result is drive roll slippage, disengage the gun, pull the gun cable forward about 6" (150 mm). There should be a slight waviness in the exposed wire. If there is no waviness, the pressure is too low. Increase the pressure setting turn, reconnect the gun, tighten locking clamp and repeat the above steps.

PROCEDURE FOR SETTING ANGLE OF FEEDPLATE

1) Loosen the clamping collar screw using a 3/16" Allen wrench. The clamping collar screw is accessed from the bottom of the feedplate. It is the screw which is perpendicular to the feeding direction.

2) Rotate feedplate to the desired angle and tighten clamping collar screw.

GAS GUARD REGULATOR SETTING

1) With the gas supply shut off, the Gas Guard regulator flow adjusting Key should be set to maximum (full clockwise) which is rated to be 60 SCFH (28 l/min).

2) Adjust gas supply flow rate for a level higher than will be required, then adjust Gas Guard flow adjusting Key counterclockwise to the desired gas flow rate.

MAKING A WELD

1) Use only a network compatible power source.

2) Properly connect the electrode and work leads for the correct electrode polarity.

3) Set all desired parameters such as trigger logic, Run-in Speed, Acceleration, Electrode polarity, etc. per “DIP SWITCH SETUP” in the INSTALLATION section.

4) Set 2-step, 4-step switch on wire drive to desired mode of operation. (Refer to “2-step/4-step switch operation” in this section.)

5) Select Weld Mode. (Refer to Control Box Operation in this section).

6) Use Control Select switches, increment/decrement switches, and encoder knobs to set desired parameters for weld depending on what options are installed. (Refer to Control Box Operation in this section).

7) Feed the electrode through the gun and cable and then cut the electrode within approximately .38" (9.5 mm) of the end of the contact tip for solid wire and within approximately .75" (19mm) of the extension guide for cored wire.

8) Connect work cable to metal to be welded. Work cable must make good electrical contact to the work. The work must also be grounded as stated in "Arc Welding Safety Precautions".

⚠ WARNING

When using an Open Arc process, it is necessary to use correct eye, head, and body protection.

9) If used, be sure shielding gas valve is turned on.

10) Position electrode over joint. End of electrode may be lightly touching the work.

11) Lower welding helmet, close gun trigger, and start welding. Hold the gun so the contact tip to work distance gives the correct electrical stickout as required for the procedure being used.

12) To stop welding, release the gun trigger and then pull the gun away from the work after the arc goes out and Postflow time, if used, is over.

13) If required, starting can be optimized by adjusting the acceleration and/or run-in speed. (Refer to Control Box Operation in this section).

WIRE REEL CHANGING

At the end of a coil, remove the last of the old electrode coil from the conductor cable by either pulling it out at the nozzle end of the gun or by using the following procedure:

1) Cut the end of the electrode off at the gun end. Do not break it off by hand because this puts a slight bend in the wire making it difficult to pull it back through the nozzle.

2) Disconnect the gun cable from the gun connector on the Power Feed 10 wire drive unit and lay the gun and cable out straight.

3) Using pliers to grip the wire, pull it out of the cable from the connector end.

4) After the electrode has been removed, reconnect the gun cable to the drive. Load a new reel of electrode per the instructions in “Wire Reel Loading” in this section.

WIRE FEED OVERLOAD PROTECTION

The wire drive has solid-state overload protection of the wire drive motor. If the wire drive motor becomes overloaded for an extended period of time the wire drive will issue a shutdown command to the Control Box and force it’s status light to blink between green and red. The Control Box turns off the power source, wire feed and gas solenoid. The status light on the wire drive will continue to blink between green and red for about 30 seconds before the wire drive will automatically reset. At that time, the wire drive will issue a shutdown over command to the Control Box that will return the system to normal operation. The wire drive will force it’s status light to solid green.

Overloads can result from improper tip size, liner, drive rolls, or guide tubes, obstructions or bends in the gun cable, feeding wire that is larger than the rated capacity of the feeder or any other factors that would impede normal wire feeding. (See “Avoiding Wire Feeding Problems” in the MAINTENANCE section).

COMPONENT STATUS LIGHTS

Each network component has a single status light. The light is a bicolor, Green/Red, LED. The purpose of the status light is to allow the operator to quickly identify that the system is working properly or, if not, which component is causing the problem. By using the status lights the operator can quickly pinpoint the system problem to a particular component. See the following table for a complete listing and description of all status light conditions.

NOTE: The green light **ON and steady** indicates a normal functioning system.

STATUS LIGHT STATES

LED State	Power Source LED	LED on any other nodes (components); Wire Feeder, Control Box Etc.
Off	Power Source is not turned ON or is not functioning correctly.	The system component is not receiving input power or is faulty.
Green LED blinking at a “normal” rate	It should only blink for a few seconds while the system is mapping (identifying components). If blinking continues every group may have a mapping error. (DIP switches may be set incorrectly).	It should only blink for a few seconds until the system component (node) has been recognized. If the blinking continues at least one node in the group has a mapping error (DIP switches may be set incorrectly). The node or nodes with mapping errors will be blinking red. • There may be too many components in the group. All components in the group will be blinking green. • The power source bus may not be available. The bus may be being used to program another component. • The LED’s of the power source and the component being programmed will be solid green.
Red LED blinking at a “normal” rate	Indicates a recoverable communication fault. The power source should automatically recover: If it cannot recover the LED will be solid red.	Indicates a recoverable communication fault most likely caused by one of the following. • More than one control box (UI) in the group. All control boxes in the group will be blinking red. • No control box (UI) in the group. All nodes in the group will be blinking red. • More than one node, of the same equipment type, has the same group and feed head (FH) numbers. All these nodes will be blinking red. • The feed head DIP switches may be set to zero. The nodes with DIP switches set to zero will be blinking red. • The node bus may be off.
Red/Green LED blinking at a “normal” rate	Indicates a recoverable hardware fault such as over temperature, overload shutdown etc.	Indicates a recoverable hardware fault such as over temperature, overload shutdown etc. Could also be an open shutdown circuit at the feed head (leads 570, 572 with tab terminals) typically used for water flow shutdown switches.

STATUS LIGHT STATES (CON'T)		
LED State	**Power Source LED**	**LED on any other nodes (components); Wire Feeder, Control Box Etc.**
Red LED blinking at a fast rate	Power source needs to be reprogrammed. Contact your Local Authorized Lincoln Field Service Facility.	System component (node) needs to be reprogrammed. Contact your Local Authorized Lincoln Field Service Facility.
Red LED ON and steady	Power source has a non-recoverable hardware fault. Contact your Local Authorized Lincoln Field Service Facility.	System component (node) has a non-recoverable hardware fault. Contact your Local Authorized Lincoln Field Service Facility.
Green LED ON and steady	System normal and functional.	System normal and functional.

Normal Blinking LED - Each illumination should exist for 0.5 seconds.
Fast Blinking LED - Each illumination should exist for 0.1 seconds.

TABLE C.1 – DRIVE ROLL AND GUIDE TUBE KITS

Wire Size		4-Roll DH Drive (4-Driven)
Solid Steel Electrode		
0.023" - 0.025"	(0.6 mm)	KP1505 - 030S
0.030"	(0.8 mm)	KP1505 - 030S
0.035"	(0.9 mm)	KP1505 - 035S
0.040"	(1.0 mm)	KP1505 - 040S
0.040"	(1.0 mm)	KP1505 - 045S
0.045"	(1.2 mm)	KP1505 - 045S
0.052"	(1.4 mm)	KP1505 - 052S
1/16"	(1.6 mm)	KP1505 - 1/16S
5/64"	(2.0 mm)	KP1505-5/64
3/32"	(2.4 mm)	KP1505-3/32
Cored Electrode		
0.030	(0.8 mm)	KP1505 - 035C
0.035"	(0.9 mm)	KP1505 - 035C
0.040"	(1.0 mm)	KP1505 - 045C
0.045"	(1.2 mm)	KP1505 - 045C
0.052"	(1.4 mm)	KP1505 - 052C
1/16"	(1.6 mm)	KP1505 - 1/16C
0.068"	(1.7 mm)	KP1505 - 068
5/64"	(2.0 mm)	KP1505 - 5/64
3/32"	(2.4 mm)	KP1505 - 3/32
7/64" Lincore Hard Facing	(2.8mm)	KP1505 - 7/64H
7/64"	(2.8mm)	KP1505 - 7/64
.120"	(3.0mm)	KP1505 - 120
Aluminum Electrode		
0.035"	(0.9 mm)	KP1507 - 035A
0.040"	(1.0 mm)	KP1507 - 040A
3/64"	(1.2 mm)	KP1507 - 3/64A
1/16"	(1.6 mm)	KP1507 - 1/16A
3/32"	(2.2 mm)	KP1507 - 3/32A

DESCRIPTION AND INSTALLATION OF OPTIONAL CONTROL BOX PANELS

A number of Optional Features are available for use with Power Feed 10. Some Installation information is provided in this section. REFER TO THE INSTRUCTIONS THAT COME WITH EACH KIT FOR DETAILED INFORMATION REGARDING INSTALLATION.

OPTIONAL PANELS FOR CONTROL BOX

All optional panels for the control box are described in the ACCESSORIES section of this manual along with their installation instructions as are all other pieces of optional equipment.

The PF-10 Control Box is designed to accept three control panels, two 'large' and one "small" panels are needed to make up a complete control panel for the Control Box. Panels can be mounted in one of three positions: upper, middle and lower.

Each Control Box is shipped with a Control/Display (CD) panel, a large panel, installed in the upper position, and a CV/Gouge (CV/G) panel (another large panel) in the lower position. The middle position is filled with a blank panel.

The CD panel must be installed in every Control Box. The small panel can be blank, it can be a Dual Procedure panel, or a Dual Procedure Memory panel. The remaining large panel can be one of the following: CV/G, M, MX2, or MSP2. The features of each are described in the Operation section of this manual.

There are extra mounting holes in the upper and middle positions which allow the upper two panels to be interchanged. (Instead of the upper, middle and lower panels being large, small and large, they could be installed in the order small, large, large.) This may be done for convenience sake, or to take advantage of the Large Security Door option.

Note: The CD panel must be installed in either the middle or the upper position; its harness is not long enough to allow installation in the lower position.

GENERAL PANEL INSTALLATION GUIDELINES:

Installation or removal of any panel can be done with only a Phillips screwdriver after the system power is turned off. To remove a panel, remove the two screws holding it in place, remove the push-on chassis ground wire and remove the harness connection to the Control Box main PC board. To install any panel, reverse that process. Turn power back on when complete (option panels are only recognized at power up. Do not install panels with the power on.) Note that removal or installation of any panel may also require the removal of the other panel, in order to have easy access to the PC board connectors. Detailed installation instructions are shipped with each option panel.

K1542-5 DUAL PROCEDURE PANEL

The Dual Procedure Panel provides a fixed large bat toggle switch or the use of a gun switch for the selection of either of two procedures. The upper position of the bat switch selects PROCEDURE A, while the lower selects PROCEDURE B. The middle position selects the GUN switch, in which case the procedure is determined by the position of the switch located at the gun.

NOTE: Due to the nature of fixed position switches, this option does not allow the indication of a remotely selected procedure. When in the gun mode there is no prevision to indicate, at the Control Box, which procedure has been remotely selected (at the gun) .

Installation is as follows:

1. Turn off power.
2. Remove the two screws from the front of the standard or option panel at the location you choose to install your new option, (middle), of the Control Box cabinet. Save the screws for re-use. Unplug the white electrical connector. Remove the chassis wire (if equipped) from the back of the standard or option panel. Discard the old panel or save for future use.
3. Tilt the new option panel away from the front opening of the Control Box cabinet and plug the white electrical connector into the proper connector on the right side of the main printed circuit board (10 pin) until the connector latches into place. Attach the chassis wire (if equipped) to the back of the new panel.
4. Slide the new panel through the opening, taking care not to damage the connections and the printed circuit board on the back.
5. Align the screw holes. Replace the two screws and tighten.

K1542-6 “M” PANEL

The M Panel provides a fixed large bat toggle switch selection of three Power Source modes. The upper position selects the generic CV/MIG mode from the power source, the middle position selects the CV/FLUX CORED mode, and the lower position selects the CC/STICK/GOUGE mode. Arc control is accomplished through the use of the ARC CONTROL potentiometer. The arc control value is actually a trim with zero being the nominal and the scale ranging from (-10) to (+10). Preflow, postflow, and spot time default to zero or off. Run-in defaults to the minimum value or weld speed, depending on the position of its associated dip switch. Burn back defaults to the on board trimmer adjustment.

NOTE: Due to the nature of fixed position switches, potentiometers, and default values, this option does not allow the mode, arc control, timers, or Burn back values to be included in dual procedure or memory information. They are overridden by the fixed values.

CC/STICK/GOUGE Mode
Selecting the CC/STICK/GOUGE mode on this panel automatically energizes the output terminals on the power source, making the power source immediately ready to weld. In the CC modes, the output current is set by the Amps control, and the Volts/Trim adjustment has no effect in this mode. In this mode, the Arc Control adjusts the arc force. Increasing the Arc Control setting increases the arc force, making the arc more harsh but less likely to stick. Decreasing the Arc Control setting decreases the arc force, making the arc softer and smoother.

Constant Voltage (CV/Weld, CV/MIG, CV/Flux Cored) Procedures
When in this mode, the Arc Control adjusts the inductance. (This adjustment is often referred to as ’pinch”. Inductance is inversely proportional to pinch.) Increasing the Arc Control setting decreases the inductance, which results in the arc getting colder and pinched tighter. Decreasing the Arc Control setting increases the inductance, which results in the arc getting wider (reduced pinch).

Installation is as follows:

1. Turn off power.

2. Remove the two screws from the front of the standard or option panel at the location you choose to install your new option, (bottom), of the Control Box cabinet. Save the screws for re-use. Unplug the white electrical connector. Remove the chassis wire (if equipped) from the back of the standard or option panel. Discard the old panel or save for future use.

3. Tilt the new option panel away from the front opening of the Control Box cabinet and plug the white electrical connector into the proper connector (12 pin) on the right side of the main printed circuit board until the connector latches into place. Attach the chassis wire (if equipped) to the back of the new panel.

4. Slide the new panel through the opening, taking care not to damage the connections and the printed circuit board on the back.

5. Align the screw holes, replace the two screws and tighten.

K1542-11 MX2 PANEL (LARGE PANEL)

The MX2 Panel provides a selection of four Power Source modes. In addition, it provides for the adjustment of the following parameters: preflow, run in, arc control, burnback, postflow, and spot time.

Descriptions
Indicator Lights - Extra bright red LED's for viewing at almost any angle. Always indicate the mode and active parameter being displayed.

Display - Extra bright, 3 1/2 digit, .56" (14.2 mm) character height, red LED display for viewing at almost any angle. Displays the value or status of the active parameter.

Available Modes - CV/MIG
CV/ FLUX CORED
CC/STICK CRISP
CC/STICK SOFT

Due to the nature of the system, the following feature is required for safety reasons: upon entering any constant current (CC) mode, the right encoder, labeled "Volts, Trim" on the Display/Control Panel acts as a "soft" contactor switch. The encoder knob must be turned Clock Wise at least 45° to activate the output (turning Counter Clock Wise 45° deactivates the output). This prevents the output from inadvertently becoming "hot" when scrolling through the weld modes. The exception to this rule is when the weld mode is entered by a change in procedure (using a memory panel such as the K1542-9 Memory/Dual Procedure panel). In this case, the state of the contactor is recalled as it was left when the procedure was exited.

In the CC modes, the output current is set by the Amps control, and the Volts/Trim adjustment has no effect in this mode. In this mode, the Arc Control adjusts the arc force. Increasing the Arc Control setting increases the arc force, making the arc more harsh but less likely to stick. Decreasing the Arc Control setting decreases the arc force, making the arc softer and smoother.

Parameter Ranges:
PREFLOW - 0.0 to 2.5 seconds (0.1 sec. increments).
RUN IN - Low Range: 50 to 150 IPM (1.25 to 3.80 MPM).
- High Range: 75 to 150 IPM (2.00 to 3.80 MPM).
ARC CONTROL - Trim (-10.0) to (+10.0) , (0) is nominal.
BURN BACK - 0.0 to 0.25 sec. (0.01 sec. increments).
POSTFLOW - 0.0 to 2.5 sec. (0.1 sec. increments).
CRATER - ON or OFF (Functions in 4 step trigger mode only).

Mode Selection
The MODE SELECT switch is a momentary large bat three position toggle switch that defaults to the center (off) position. Moving the switch bat up advances the mode indicator in the upward direction, down advances it in the downward direction. Holding the switch in either direction will result in the indicator advancing at a high rate of speed in that direction, until the switch is released. When the indicator reaches its upper or lower limit, advancing ceases until the direction of the switch is changed.

Parameter Selection
The PARAMETER SELECT switch is a momentary large bat three position toggle switch that defaults to the center (off) position. Moving the switch bat up advances the parameter indicator in the upward direction, down advances it in the downward direction. Holding the switch in either direction will result in the indicator advancing at a high rate of speed in that direction, until the switch is released. When the indicator reaches its upper or lower limit, advancing ceases until the direction of the switch is changed.

Parameter Adjustment
The value of the active parameter, as defined by the parameter indicator, is displayed on the parameter display. The PARAMETER SET switch is a momentary large bat three position toggle switch that defaults to the center (off) position. Moving the switch bat up advances the displayed value in the positive direction, down advances it in the negative direction. Holding the switch in either direction will result in the displayed value advancing at a high rate of speed in that direction, until the switch is released. When the indicator reaches its upper or lower limit, advancing ceases until the direction of the switch is changed.

Crater fill operation is covered in the WIRE DRIVE OPERATION section.

Installation is as follows:

1. Turn off power.

2. Remove the two screws from the front of the standard or option panel at the location you choose to install your new option, (bottom), of the Control Box cabinet. Save the screws for re-use. Unplug the white electrical connector. Remove the chassis wire (if equipped) from the back of the standard or option panel. Discard the old panel or save for future use.

3. Tilt the new option panel away from the front opening of the Control Box cabinet and plug the white electrical connector into the proper connector (12 pin) on the right side of the main printed circuit board until the connector latches into place. Attach the chassis wire (if equipped) to the back of the new panel.

4. Slide the new panel through the opening, taking care not to damage the connections and the printed circuit board on the back.

5. Align the screw holes, replace the two screws and tighten.

K1542-12 MSP2 PANEL AND K1542-10 MS/STT PANEL (LARGE PANEL)

The MSP2 or MS/STT Panel provides a selection of numerous process specific and generic Power Source modes. In addition, it provides for the adjustment of the following parameters: preflow, run in, arc control, burnback, postflow and spot time. Only one parameter, as defined by the parameter indicator, may be displayed and adjusted at a time.

The installation and operation of the MS/STT panel is identical to the MSP2 panel. The difference is that the MS/STT selects STT procedures and is only functional when used with a Power Wave 455 STT Power Source.

Description:
Indicator Lights - Extra bright red LED for viewing at almost any angle. Always indicate the active parameter being displayed.

Display - Extra bright, 3 1/2 digit, .56" (14.2 mm) character height, red LED display for viewing at almost any angle. Displays the value or status of the active parameter.

Parameter Ranges
WELD MODE - Adjustable per mode schedule.
PREFLOW - 0.0 to 2.5 seconds (0.1 sec. increments).
RUN IN - Low Range: 50 to 150 IPM (1.25 to 3.80 MPM).
- High Range: 75 to 150 IPM (2.00 to 3.80 MPM).
ARC CONTROL - Trim (-10.0) to (+10.0) , (0) is nominal.
BURN BACK - 0.0 to 0.25 sec. (0.01 sec. increments).
POSTFLOW - 0.0 to 2.5 sec. (0.1 sec. increments).
CRATER - ON or OFF (Functions in 4 step trigger mode only).

Mode Schedule - Table on the front of the option used by the operator to correlate the displayed mode number to an actual Power Source mode.

Due to the nature of the system, the following feature is required for safety reasons: upon entering any constant current (CC) mode, the right encoder, labeled "Volts", "Trim", on the Display/Control Panel acts as a "soft" contactor switch. The encoder knob must be turned Clock Wise at least 45° to activate the output (turning Counter Clock Wise 45° deactivates the output). This prevents the output from inadvertently becoming "hot" when scrolling through the weld modes. The exception to this rule is when the weld mode is entered by a change in procedure (using a memory panel such as the K1542-9 Memory/Dual Procedure panel). In this case, the state of the contactor is recalled as it was left when the procedure was exited.

In the CC modes, the output current is set by the Amps control, and the Volts/Trim adjustment has no effect in this mode. In this mode, the Arc Control adjusts the arc force. Increasing the Arc Control setting increases the arc force, making the arc more harsh but less likely to stick. Decreasing the Arc Control setting decreases the arc force, making the arc softer and smoother.

Parameter Selection
The PARAMETER SELECT switch is a momentary large bat three position toggle switch that defaults to the center (off) position. Moving the switch bat up advances the parameter indicator in the upward direction, down advances it in the downward direction. Holding the switch in either direction will result in the indicator advancing at a high rate of speed in that direction, until the switch is released. When the indicator reaches its upper or lower limit, advancing ceases until the direction of the switch is changed.

Parameter Adjustment
The value of the active parameter, as defined by the parameter indicator, is displayed on the parameter display. The PARAMETER SET switch is a momentary large bat three position toggle switch that defaults to the center (off) position. Moving the switch bat up advances the displayed value in the positive direction, down advances it in the negative direction. Holding the switch in either direction will result in the displayed value advancing at a high rate of speed in that direction, until the switch is released. When the indicator reaches its upper or lower limit, advancing ceases until the direction of the switch is changed.

GMAW Pulse Procedures
In these procedures, the actual voltage greatly depends on the waveform used. The peak currents, background currents, rise times, fall times, and pulse times all affect the actual voltage. The actual voltage for a given wire feed speed is not directly predictable unless the waveform is known. In this case, it is not practical to preset an actual voltage for the procedure. Instead, an arc length adjustment is provided. The machine "knows" what the best arc length is at the given wire feed speed but allows the operator to change it.

The arc length trim (usually referred to simply as "trim") can be adjusted between 0.500 and 1.500 on the Control Box's Volts/Trim display. An Trim of 1.000 means that no adjustments will be made to the preset arc lengths. A Trim setting less than 1.000 decreases the preset arc lengths. The arc length trim adjustment is factored in at all wire feed speed settings. Increasing the Trim by 10 percent at a given wire feed speed also increases all the other arc length trim settings of the procedure by 10 percent.

Lincoln Power Wave power sources utilizes a control scheme known as adaptive control in all pulse modes. Because the Power Wave utilizes adaptive control, it can adjust the pulsing parameters based on changes in the arc due to changes in the electrical stickout of the electrode. (Contact Tip to Work Distance(CTWD) is the distance from the contact to the work piece.) The Power Wave is optimized for use with a .75" stickout. The adaptive behavior is programmed to support a stickout range from .5" to 1.25". In the low and high end of the wire feed speed ranges of most processes, the adaptive behavior may be restricted. This is a physical restriction due to reaching the edge of the operating range for the process.

The Arc Control adjustment allows the pulse frequency to be varied. Increasing the Arc control causes the frequency setting to increase, while decreasing the Arc Control causes the frequency to decrease. Varying the Arc Control, and hence, the pulse frequency, affects the droplet transfer and allows fine-tuning for different welding positions.

Crater Fill operation is covered in the WIRE DRIVE OPERATIONS section.

Installation is as follows:

1. Turn off power.

2. Remove the two screws from the front of the standard or option panel at the location you choose to install your new option, (bottom), of the Control Box cabinet. Save the screws for re-use. Unplug the white electrical connector. Remove the chassis wire (if equipped) from the back of the standard or option panel. Discard the old panel or save for future use.

3. Tilt the new option panel away from the front opening of the Control Box cabinet and plug the white electrical connector into the proper connector (12 pin) on the right side of the main printed circuit board until the connector latches into place. Attach the chassis wire (if equipped) to the back of the new panel.

4. Slide the new panel through the opening, taking care not to damage the connections and the printed circuit board on the back.

5. Align the screw holes, replace the two screws and tighten.

K1542-9 DUAL PROCEDURE / MEMORY PANEL (SMALL PANEL)

Note: This panel will function with S24004-3 and higher Control Box Software only.

The Dual Procedure / Memory panel provides for the selection of either of two procedures, or a gun switch for remote selection of the procedure. In addition, there are six permanent memory storage locations for saving commonly used procedures. Procedures A and B are "soft" type memories that record any changes made to them. The six memory locations are "hard" or more permanent type memories. Any changes made must be consciously saved back to them. Furthermore, each memory contains only one procedure, therefore any combination of memories may be recalled to procedure A and B.

Descriptions

Indicator Lights - Extra bright red LED's for viewing at almost any angle. Always indicate the procedure, also indicate active memory and save mode if applicable.

Switches - Discreet PC board mounted switches, UL and CSA approved, with an IEC rating of protection class IP67.

Switch Covers - Heavy duty switch covers of silicone rubber providing a high degree of protection from heat and dust. Covers are designed to be individually field replaceable in the unlikely event that one gets damaged.

Dual Procedure Selection

The procedure switch is used to scroll the indicator to select PROCEDURE A, PROCEDURE B, or the GUN switch. When the GUN switch is selected, the procedure is determined by the position of the switch located at the gun. Under this condition, indicators will show that the gun switch has been selected and also which procedure the gun switch is requesting.

Memory Selection

RECALL - When a memory key is depressed its indicator comes on, and its contents are copied to the active procedure. As long as no changes are made to the contents of that procedure, the memory indicator will be on anytime that procedure is active. This indicates that their contents are the same. Any change to that procedure will cause the memory indicator to go off, indicating that they are no longer equal.

SAVE - The save mode allows “hard” memories to be changed. Pressing the SAVE key will light the save indicator, and enter the save mode. In the save mode, the indicator for the memory that was the source of the active procedure’s contents will blink, whether their contents are still equal or not. This feature allows the user to choose to save an active procedure back to its source, or some other location.

To complete the save transaction requires the selection of one of the memory keys. When the memory key is pressed in the save mode, it’s contents are overwritten with the contents of the active procedure. This means that the contents of the memory location and the active procedure are now equal, and therefore, by definition, each of their indicators will be lit, and the save mode will be exited. To exit the save mode without saving, depress the save key a second time. This feature allows the operator to determine the source of the active procedure’s contents without actually overwriting it.

Installation is as follows:

1. Turn off power.

2. Remove the two screws from the front of the standard or option panel at the location you choose to install your new option, (middle), of the Control Box cabinet. Save the screws for re-use. Unplug the white electrical connector. Remove the chassis wire (if equipped) from the back of the standard or option panel. Discard the old panel or save for future use.

3. Tilt the new option panel away from the front opening of the Control Box cabinet and plug the white electrical connector into the proper connector on the right side of the main printed circuit board (10 pin) until the connector latches into place. Attach the chassis wire (if equipped) to the back of the new panel.

4. Slide the new panel through the opening, taking care not to damage the connections and the printed circuit board on the back.

5. Align the screw holes. Replace the two screws and tighten.

K1543, K1544 AND K1545 INPUT CABLE ASSEMBLIES

Available Cable Assemblies:

K1543 - Control cable only. Consists of a 5-conductor control cable with a 5-pin control cable plug, without electrode cable, and is available in lengths of 8'(2.4m), 16'(4.9m), 25'(7.6m), 50'(15.2m) and 100'(30.5m).

K1544 - Consists of a 5-conductor control cable with a 5-pin control cable plug and a 4/0 electrode cable. It is rated at 600 amps, 60% duty cycle and is available in lengths of 8'(2.4m), 16'(4.9m), 25'(7.6m), 50'(15.2m).

K1545 - Control cable and a 4/0 (85 mm2) electrode cable with Twist-Mate™ connector on one end and a stud terminal on the other. It is rated at 500 amps, 60% duty cycle and is available in lengths of 8'(2.4m), 16'(4.9m), 25'(7.6m), 50'(15.2m).

With input power disconnected from the power source, install the Control Cable Assemblies per the instruction in INSTALLATION - “Cable Connections”.

K1548-1 LINC NET RECEPTACLE KIT (INPUT AND OUTPUT)

LINC NET RECEPTACLE (OUTPUT)

Optional Output Connector Installation into the Control Box Cabinet and/or into the Feeder Head Enclosure.

Control Box Cabinet Procedure

1. Turn off power.
2. Remove the screws from the front of the lower and middle option panels of the User Interface cabinet.
3. Tilt the option panels away from the front opening of the Control Box cabinet. If the option panel has an electrical connector, disconnect it from the main printed circuit board (note connection point for re-connection later). Remove the option panel and set aside.
4. Remove the plastic plug (black) from the left hole in the bottom of the Control Box cabinet and store it in the bottom of the Control Box cabinet for future use, should the Optional Output Connector be removed.
5. Place the Optional Output Connector (Amphenol) through the hole opened by the previous step (place from the inside, out). Rotate the Optional Output Connector so it's aligning key is positioned to the front of the Control Box cabinet. Fasten the Optional Output Connector to the bottom wall of the Control Box cabinet with the four screws provided.
6. Secure the choke (large circular component of the Optional Output Connector) by inserting it's leads into the white nylon clip located near the Optional Output Connector on the back wall of the Control Box cabinet. Insert the choke leads only.
7. The Optional Output Connector has two internal connectors, a four pin, and a single lead connector. Connect the four pin connector to the unused four pin connector on the main printed circuit board. Connect the single lead connector to a similar connector found on a lead nearby that branches out of the Control Box wiring harness.
8. Re-install the lower and middle option panels by reversing the removal process. While re-installing the option panels, ensure clearance between Optional Output Connector components, Control Box wiring harness, and option panel harness (if any).

Feeder Head Enclosure Procedure

1. Turn power off.
2. Remove the Feeder Head rear access door. The Feeder Head cover can be removed to aid installation, but is not required.
3. Remove the plastic plug (black) from the hole at the right rear of the Feeder Head and store it in the left side of the Feeder Head rear compartment for future use, should the Optional Output Connector be removed.
4. Disconnect a printed circuit board connector located at the bottom right corner of the printed circuit board and position it to the left so as to provide clear access to the lower right corner of the Feeder Head enclosure.
5. Place the Optional Output Connector (Amphenol) through the hole opened by the two previous steps (place from the inside, out). Rotate the Optional Output Connector so it's aligning key is positioned to the top of the Feeder Head enclosure. Fasten the Optional Output Connector to the back wall of the Control Box cabinet with the four screws provided.
6. Secure the choke (large circular component of the Optional Output Connector) by inserting it's leads into the white nylon clip located near the Optional Output Connector on the floor of the Feeder Head. Insert the long choke leads rather than the short leads that run between the choke and the Output Connector. Insert the choke leads only.
7. The Optional Output Connector has two internal connectors, a four pin, and a single lead connector. Connect the four pin connector to the unused four pin connector on the printed circuit board. Connect the single lead connector to a similar connector found on a lead nearby that branches out of the Feeder Head wiring harness.
8. Reconnect the printed circuit board connector that was disconnected earlier.
9. Replace the rear access door and Feeder Head cover if removed.

LINC NET RECEPTACLE (INPUT)

Power Feed Wire Feeder Optional Input Connector Installation into the Control Box Cabinet and Conversion to Fixture Wire Feeder

1. Turn off power.

2. Remove the screws from the front of the lower and middle option panels of the Control Box cabinet.

3. Tilt the option panels away from the front opening of the Control Box cabinet. If the option panel has an electrical connector, disconnect it from the main printed circuit board (note connection point for re-connection later). Remove the option panel and set aside.

4. Disconnect the connector located at the back wall of the Control Box cabinet.

5. Loosen (do not remove) the four screws located on the back wall of the Control Box cabinet.

6. Lift Control Box cabinet off of the four screws loosened above and set on a work surface. Re-tighten the four screws to secure for future use.

7. Remove the plastic plug (black) from the right hole in the bottom wall of the Control Box cabinet and insert it into the hole in the front of the Feeder Head.

8. Place the Optional Input Connector (Amphenol) through the hole opened by the previous step (place from the inside, out). Rotate the Optional Input Connector so it's aligning key is positioned to the front of the Control Box cabinet. Fasten the Optional Input Connector to the bottom wall of the Control Box cabinet with the four screws provided and connect the option's opposite end to the connector referred to in step 4.

9. Secure the choke (large circular component of the Optional Input Connector) by inserting it's leads into the white nylon clip located near the Optional Input Connector on the back wall of the Control Box cabinet. Insert the choke leads only.

10. Install an Optional Output Connector (Lincoln stock # K1549-1) into the Control Box cabinet, if not already present.

11. Mount the Control Box cabinet to the work station fixture at this time, if desired. The four holes in the back wall of the Control Box cabinet can be used for this purpose.

12. Re-install the lower and middle option panels by reversing the removal process. While re-installing the option panels, ensure clearance between Optional Input Connector components, Control Box wiring harness, and option panel wiring harness (if any).

K162H - WIRE SPINDLE ADAPTER

Spindle for boom mounting Readi-Reels and 2" (51 mm) I.D. spools with up to 60 lb. (27.2 kg) capacity. User mounted to appropriately prepared boom framework. Includes an easily adjustable friction brake for control of overrun (a 2" spindle is standard on Power Feed 10 Bench model).

When a 2" (51 mm) spindle is used with Readi-Reels, or coils not on 12" (305 mm) O.D. spools, an adapter is required:

K1504-1 - COIL ADAPTER

Permits 50 lb to 60 lb (22.7-27.2 Kg.) coils to be mounted on 2" (51 mm) O.D. spindles.

K435 - COIL ADAPTER

Permits 14 lb. (6 kg) Innershield coils to be mounted on 2" (51 mm) O.D. spindles.

K363P - READI-REEL ADAPTER

Adapts Lincoln Readi-Reel coils of electrode 30 lb. (14 kg) and 22 lb. (10 kg) to a 2" (51 mm) spindle. Durable molded plastic one piece construction. Designed for easy loading; adapter remains on spindle for quick changeover.

K438 - READI-REEL ADAPTER

Adapts Lincoln Readi-Reel coils of electrode 50-60 lb. (22.7-27.2 kg) to a 2" (51 mm) spindle

GUNS AND GUN ADAPTERS

The Power Feed 10 wire feeder is equipped with a factory installed K1500-2 gun connection Kit. This kit is for guns having a Tweco™ #2-#4 connector. The Power Feed 10 has been designed to make connecting a variety of guns easy and inexpensive with the K1500 series of gun connection kits. Gun trigger and dual procedure lead connections connect to the single 5 pin receptacle on the front of the wire drive box.

MAGNUM 200/300/400 GUNS

The easiest and least expensive way to use Magnum 200/300/400 guns with the Power Feed 10 wire feeder is to order them with the K466-10 connector kit, or to buy a completely assembled Magnum gun having the K466-10 connector (such as the K471-21, -22, and -23 dedicated Magnum 400 guns and the K497-20 and -21 dedicated Magnum 200 guns).

MAGNUM 550 GUNS

The easiest and least expensive way to use the Magnum 550 guns with Power Feed 10 wire feeders is to order the gun with the K613-2 connector kit, and install a K1500-3 gun connection kit to the wire feeder.

LINCOLN INNERSHIELD AND SUB ARC GUNS

All of these guns can be connected to the Power Feed by using the K1500-1 Adapter Kit.

LINCOLN FUME EXTRACTION GUNS

The K556 (250XA) and K566 (400XA) guns require that a K489-7 Fast-Mate™ adapter kit be installed.

The K206, K289, and K309 require only the installation of a K1500-1 connector in the Power Feed wire feeder.

NON-LINCOLN GUNS

Most competitive guns can be connected to the Power Feed by using one of the K1500 series adapter kits.

GUN RECEIVER BUSHINGS AND ADAPTERS

K489-7 (DUAL SCHEDULE FAST-MATE ADAPTER)

This adapter installs directly into the wire drive feedplate, to provide for use of guns with Fast-Mate or European style gun connections. This K489-7 will handle both standard Fast-Mate and Dual Schedule Fast-Mate guns.

K1500-1 (LINCOLN INNERSHIELD GUN STANDARD CONNECTION)

Use this kit to connect the following guns: Guns having a Lincoln standard Innershield gun connector, Magnum 200/300/400 with K466-1 connector kit, and Magnum 550 guns with the K613-1 gun connection kit.

K1500-2 (TWECO #2-#4 TYPE CONNECTION)

The K1500-2 gun adapter comes factory installed on the Power Feed 10 wire feeder. Use this adapter for guns that have a Tweco #2-#4 connector. Such guns include Magnum 200/300/400 guns with K466-2 connector kit, and completely factory assembled Magnum guns that are factory equipped with the K466-2 connector (such as the K471-21, -22, and -23 dedicated Magnum 400 guns and the K497-20 and -21 Magnum 200 guns).

K1500-3 (TWECO #5 CONNECTION)

For Magnum 550 gun with K613-2 Connection Kit, and any other gun having a Tweco #5 connector .

K1500-4 (MILLER CONNECTION)

For any gun having a newer style Miller connector.
Install gun adapters per the instructions shipped with it.

CONDUIT ADAPTERS

K1546-2 ADAPTER

for use with Lincoln Magnum conduit and E-Beam conduit (wire sizes 1/16 - .120)

For Magnum conduit:

Install the K1546-2 gun adapter at the incoming end of the feed plate, secure with the set screw located at the back of the feed plate. If a brass fitting is supplied with the conduit, remove it from the feeder end of the conduit by unscrewing it. Insert the conduit into the K1546-2, secure the conduit by fastening it the the adapter with the supplied knob screw.

For E-Beam Conduit:

Install the K1546-2 gun adapter at the incoming end of the feed plate, secure with the set screw located at the back of the feed plate. Insert the conduit into the K1546-2, secure the conduit by fastening it the the adapter with the supplied knob screw.

DUAL PROCEDURE SWITCH OPTIONS

K683-3 DUAL PROCEDURE SWITCH

Kit includes gun switch, and mountings for Lincoln Innershield and Magnum guns, with 15 ft. (4.5m) control cable and 5-pin plug with two leads to connect to gun trigger.

Connect the 5-pin plug of the K683-3 Dual procedure Switch to the Power Feed 10 Wire Feeder Trigger/Dual Procedure 5-socket receptacle.

The two lead plug cord extending out of the 5-pin plug of the Dual Procedure switch is to be connected to the two trigger leads of the welding gun per instructions shipped with the kit.

K683-1 DUAL PROCEDURE SWITCH

The K683-3 Dual Procedure Switch is the recommended method of obtaining dual procedure for non-Fast-Mate guns, but a K683-1 can be used. For using a K683-1 with a fast mate gun, see USING DUAL PROCEDURE WITH FAST-MATE GUNS. A K683-1 Dual Procedure Switch can be used on the Power Feed 10 if a K686-2 adapter is used. The K686-2 kit includes the gun switch and mountings for Lincoln Innershield and Magnum guns, with 15 ft. (4.5 m) control cable and 3-pin plug. K686-2 Adapter permits the 3-pin plug from the K683-1and 5-pin gun trigger plug to be connected to the 5-pin trigger/dual procedure receptacle on the wire feeder.

USING DUAL PROCEDURE WITH FAST-MATE GUNS

There are a number of different options available for using dual procedure with Fast- Mate guns. These configurations are outlined below along with any additional required equipment.

USING DUAL SCHEDULE WITH FAST-MATE GUNS ON -10 SERIES FEEDERS

Configuration 1

K489-7 Dual Schedule Fast-Mate adapter

K575-[ ] Magnum 400 DS/FM gun (or competitive DS/FM gun)

Configuration 2*

K489-7 Dual Schedule Fast-Mate adapter

K683-1 Dual Procedure Switch (3 pin)

K686-2 "Y" adapter (3pin + 5 pin to 5 pin)

* Non-DS Fast-Mate gun (Magnum 450WC, Magnum 200, Magnum 300, Magnum 400, and others)

K590-5 WATER CONNECTION KIT (FOR DRIVE ONLY)

Install per the instructions shipped with the kit.

K1536-1 WATER FLOW SENSOR KIT

Install per the instructions shipped with the kit

K659-1 GAS GUARD REGULATOR

Adjustable flow regulator with removable adjuster key for CO2 and Argon blend gases. Mounts onto feeder inlet, and reduces gas waste and arc start “blow” by reducing surge caused by excess pressure in supply hose.

Install the 5/8-18 male outlet of the regulator to the 5/8-18 female gas inlet on the back panel of the wire drive. Secure fitting with flow adjuster key at top. Attach gas supply to 5/8-18 female inlet of regulator per INSTALLATION section.

K1557-1 SWIVEL MOUNT

The K1557-1 Swivel mount attaches to the power source. This kit includes a feeder adapter plate that allows the feeder to rotate on top of the power source. The feeder can be easily separated from the swivel mount at any time. This option is compatible with the K1556-1 Light Duty Caster Kit.

K1556-1 LIGHT DUTY CASTER KIT

This option provides 4 casters and all required hardware to mount it to the Power Feed 10. This option is compatible with the K1557-1 Swivel Mount.

K1574-1 SECURITY DOOR (LARGE)

K1574-1 Security Door Installation into the Control Box Cabinet

1. Turn off power.
2. Unlatch and swing open the small door. Remove the two screws from the horizontal hinge rod. Save the screws.
3. While holding the door so it doesn’t fall, Slide the rod out sideways releasing the door.
4. Position the new door between the panel holes and re-install the rod so the screw holes can be accessed.
5. Replace the two screws and tighten.
6. Swing the door into the up position. A lock may be installed through the side holes for security purposes.

K1555-1 INSULATED LIFT HOOK

For applications where an insulated lift hook is required. This kit provides an easily installed, heavy duty insulated lift eye that mounts to the wire reel stand mast. See the instructions provided with the kit for installation.

K1551-2 INCOMING BUSHING (4 Ball Roller) (Standard on codes 10600 and up)

This ball bearing equipped incoming bushing can be used in place of the standard incoming wire bushing, when feeding solid steel or cored wire electrodes. It significantly reduces any abrasion to the electrode wire where it enters the feed head. This results in even smoother, more trouble free operation.

MAINTENANCE

Safety Precautions

⚠ WARNING

ELECTRIC SHOCK can kill.

- **Do not touch electrically live parts such as output terminals or internal wiring.**
- **When inching with gun trigger, electrode and drive mechanism are "hot" to work and ground and could remain energized several seconds after the gun trigger is released.**
- **Turn OFF input power at welding power source before installation or changing drive roll and/or guide tubes.**
- **Welding power source must be connected to system ground per the National Electrical Code or any applicable local codes.**
- **Only qualified personnel should perform maintenance work.**

Observe all additional Safety Guidelines detailed throughout this manual.

Routine Maintenance

Drive Rolls and Guide Tubes

After feeding every coil of wire, inspect the drive roll section. Clean it as necessary. The driver rolls and Inner Wire Guides are stamped with the wire sizes they will feed. If a wire size other than that stamped on the roll(s) is to be used, the roll(s) and Inner Wire Guides must be changed.

All drive rolls have two identical grooves. The rolls may be flipped over to use the other groove.

See "Procedure to Install Drive Rolls and Wire Guides" in the INSTALLATION section for roll changing instructions.

Wire Reel Mounting - Readi-Reels and 10 through 30lb (4.5-14kg) Spools

No routine maintenance required.

Avoiding Wire Feeding Problems

Wire feeding problems can be avoided by observing the following gun handling and feeder set up procedures:

a) Do not kink or pull cable around sharp corners.

b) Keep the electrode cable as straight as possible when welding or loading electrode through cable.

c) Do not allow dolly wheels or trucks to run over cables.

d) Keep cable clean by following maintenance instructions.

e) Use only clean, rust-free electrode. The Lincoln electrodes have proper surface lubrication.

f) Replace contact tip when the arc starts to become unstable or the contact tip end is fused or deformed.

g) Do not use excessive wire spindle brake settings.

h) Use proper drive rolls, wire guides and drive roll pressure settings.

Periodic Maintenance

Wire Drive Motor and Gearbox

Every year inspect the gearbox and coat the gear teeth with a moly-disulfide filled grease. **Do not** use graphite grease.

Every six months check the motor brushes. Replace them if they are less than 1/4" long.

Gun and Cable Maintenance

See appropriate Operator's Manual.

Procedure for Removing Feedplate from Wire Feeder

1) Loosen the clamping collar screw using a 3/16" Allen wrench. The clamping collar screw is accessed from the bottom of the feedplate. It is the screw which is perpendicular to the feeding direction.

2) Loosen the retaining screw, which is also accessed from bottom of feeder, using a 3/16" Allen wrench. Continue to loosen the screw until the feedplate can be easily pulled off of the wire feeder.

HOW TO USE TROUBLESHOOTING GUIDE

⚠ WARNING

Service and Repair should only be performed by Lincoln Electric Factory Trained Personnel. Unauthorized repairs performed on this equipment may result in danger to the technician and machine operator and will invalidate your factory warranty. For your safety and to avoid Electrical Shock, please observe all safety notes and precautions detailed throughout this manual.

This Troubleshooting Guide is provided to help you locate and repair possible machine malfunctions. Simply follow the three-step procedure listed below.

Step 1. LOCATE PROBLEM (SYMPTOM).
Look under the column labeled "PROBLEM (SYMPTOMS)". This column describes possible symptoms that the machine may exhibit. Find the listing that best describes the symptom that the machine is exhibiting.

Step 2. POSSIBLE CAUSE.
The second column labeled "POSSIBLE CAUSE" lists the obvious external possibilities that may contribute to the machine symptom.

Step 3. RECOMMENDED COURSE OF ACTION
This column provides a course of action for the Possible Cause, generally it states to contact you local Lincoln Authorized Field Service Facility.

If you do not understand or are unable to perform the Recommended Course of Action safely, contact you local Lincoln Authorized Field Service Facility.

⚠ WARNING

ELECTRIC SHOCK can kill.

- **Do not touch electrically live parts such as output terminals or internal wiring.**
- **When inching with gun trigger, electrode and drive mechanism are "hot" to work and ground and could remain energized several seconds after the gun trigger is released.**
- **Turn OFF input power at welding power source before installation or changing drive roll and/or guide tubes.**
- **Welding power source must be connected to system ground per the National Electrical Code or any applicable local codes.**
- **Only qualified personnel should perform these trouble shooting procedures.**

Observe all additional Safety Guidelines detailed throughout this manual.

⚠ CAUTION

If for any reason you do not understand the test procedures or are unable to perform the tests/repairs safely, contact your **Local Lincoln Authorized Field Service Facility** for technical troubleshooting assistance before you proceed.

Observe all Safety Guidelines detailed throughout this manual

PROBLEMS (SYMPTOMS)	POSSIBLE CAUSE	RECOMMENDED COURSE OF ACTION
1. Rough wire feeding or wire not feeding but drive rolls are turning.	a. Gun cable kinked and/or twisted. b. Wire jammed in gun and cable. Check for mechanical restrictions in feeding path. c. Check for current position of drive rolls Relative to split wire guide groove. d. Drive rolls may not be seated properly. e. Gun cable dirty. - Clean if necessary. f. Worn drive roll. g. Electrode rusty and/or dirty. Cable frayed, or poor solder joint at work or electrode lug. h. Worn nozzle or cable liner. - Replace if necessary. I. Partially flashed or melted contact tip. - Replace if necessary. j. Incorrect drive roll pressure. - Readjust if necessary. k. Improper liner, tip or inner/outer guides. - Replace if necessary.	If all recommended possible areas of misadjustment have been checked and the problem persists, **Contact your local Lincoln Authorized Field Service Facility.**

⚠ CAUTION

If for any reason you do not understand the test procedures or are unable to perform the tests/repairs safely, contact your **Local Lincoln Authorized Field Service Facility** for technical troubleshooting assistance before you proceed.

Observe all Safety Guidelines detailed throughout this manual

PROBLEMS (SYMPTOMS)	POSSIBLE CAUSE	RECOMMENDED COURSE OF ACTION
2. Variable or “hunting arc.	a. Wrong size, worn and/or melted contact tip. - Replace if necessary. b. Worn work cable or poor work connection. - Replace if necessary. c. Loose electrode or work cable connections. d. Wrong polarity. - Make sure electrode polarity is correct for process being used. e. Gas nozzle extended beyond gun tip or wire stickout too long while welding. f. Poor gas shielding on processes requiring gas. - Check gas flow and mixture.	If all recommended possible areas of misadjustment have been checked and the problem persists, **Contact your local Lincoln Authorized Field Service Facility.**
3. Poor arc striking with sticking or “blast-offs”, weld porosity, narrow and ropy looking bead, or electrode stubbing into plate while welding.	a. Improper procedures or techniques. - See “Gas Metal Arc Welding Guide” (GS-100). b. Improper gas shielding - Clean gas nozzle. Make certain that gas diffuser is not empty or turned off. Make certain gas flow rate is proper. Remove gun liner and check rubber seal for any sign of deterioration or damage. Be sure set screw in connector block is in place and tightened against the liner bushing.	

⚠ CAUTION

If for any reason you do not understand the test procedures or are unable to perform the tests/repairs safely, contact your **Local Lincoln Authorized Field Service Facility** for technical troubleshooting assistance before you proceed.

Observe all Safety Guidelines detailed throughout this manual

PROBLEMS (SYMPTOMS)	POSSIBLE CAUSE	RECOMMENDED COURSE OF ACTION
4. Tip seizes in diffuser.	a. Tip overheating due to prolonged or excessive high current and/or duty cycle welding. ***Note:*** *A light application of high temperature antiseize lubricant (such as Lincoln E2067 Graphite Grease) may be applied to tip of threads.*	If all recommended possible areas of misadjustment have been checked and the problem persists, **Contact your local Lincoln Authorized Field Service Facility.**
5. Unit shuts off while welding or attempting to weld, status light is red/green alternating between colors every second. Unit tries to recover after 30 seconds and may repeat again.	a. Wire feed shut down circuit maybe electrically open. (Leads 570 and 572 in wire feed head. b. The wire drive motor may be overloaded. Check for mechanical restrictions in the wire feeding path.	
6. Drive roll does not turn although arc voltage is present, and solenoid is on. Feed head and Control Box status LEDs are both solid green.	a. Check for loose or broken leads at the wire drive motor. b. Defective wire feed motor or feed head PC board. Note: With WFS set to max control board should supply 24 VDC to motor (leads #550, #551).	

⚠ CAUTION

If for any reason you do not understand the test procedures or are unable to perform the tests/repairs safely, contact your **Local Lincoln Authorized Field Service Facility** for technical troubleshooting assistance before you proceed.

Observe all Safety Guidelines detailed throughout this manual

PROBLEMS (SYMPTOMS)	POSSIBLE CAUSE	RECOMMENDED COURSE OF ACTION
7. No wire feed, solenoid, or arc voltage. Status LEDs are solid green.	a. Faulty gun trigger switch. The gun trigger switch or circuit may be faulty. Check or Replace.	If all recommended possible areas of misadjustment have been checked and the problem persists, **Contact your local Lincoln Authorized Field Service Facility.**
8. No control of wire feed. All status lights are solid green. Preset WFS is adjustable on Control Box	a. Defective motor tach or control PC board, or harness. Check for loose or faulty connections on motor tach. See Wiring Diagram.	
9. Wire feed motor turns and solenoid operates, but no arc voltage is present. Status light is solid green on Control Box.	a. Power source is unable to respond due to thermal or other type of shut down mode. b. Power source is defective. See Power Source LED Status Light Chart.	

⚠ CAUTION

If for any reason you do not understand the test procedures or are unable to perform the tests/repairs safely, contact your **Local Lincoln Authorized Field Service Facility** for technical troubleshooting assistance before you proceed.

Observe all Safety Guidelines detailed throughout this manual

PROBLEMS (SYMPTOMS)	POSSIBLE CAUSE	RECOMMENDED COURSE OF ACTION
10. Speed does not change when weld current flows. Status lights are solid green.	a. Run-in and weld speeds are set to the same value. b. Possible problem with current sensor electronics in power source. Check power source manual to trouble shoot current sensor electronics.	If all recommended possible areas of misadjustment have been checked and the problem persists, **Contact your local Lincoln Authorized Field Service Facility.**
11. Voltmeter and/or ammeter do not function properly even though status lights are solid green. Welding may vary from normal procedure.	a. 67 and/or 21 voltage sense leads may have intermittent or poor connections. Check. b. Possible problem with power source electronics.	
12. Purge switch on feed head does not activate solenoid but trigger closure in MIG or pulse modes does.	a. Defective gas purge switch or feed head board. Check continuity with gas purge switch held down across J1 pins 3 and 5. Release purge switch and note there should be no continuity now. If either of these fail, the problem is either in the gas purge switch or harnessing. If no failure, replace feed head board.	
13. Cold feed switch does not activate the motor but trigger does in MIG or Pulse modes. LEDs are solid green on both CB and feed head boards.	a. Defective cold feed switch or feed head PC board. Check continuity with cold feed switch held up across plug pins 3 and 4 of J1. Release the cold inch switch and note that there should be no continuity now. If either of these fail, the problem is either in the purge switch or harnessing. If continuity O.K., replace feed head board.	

⚠ CAUTION

If for any reason you do not understand the test procedures or are unable to perform the tests/repairs safely, contact your **Local Lincoln Authorized Field Service Facility** for technical troubleshooting assistance before you proceed.

Observe all Safety Guidelines detailed throughout this manual

PROBLEMS (SYMPTOMS)	POSSIBLE CAUSE	RECOMMENDED COURSE OF ACTION
14. Displays and/or indicator lights do not change when their corresponding switches and or knobs are activated to request a change.	a. The encoders or switches may be faulty. b. Check for broken harness wire(s) or harness disconnected from intended location.	If all recommended possible areas of misadjustment have been checked and the problem persists, **Contact your local Lincoln Authorized Field Service Facility.**

⚠ CAUTION

If for any reason you do not understand the test procedures or are unable to perform the tests/repairs safely, contact your **Local Lincoln Authorized Field Service Facility** for technical troubleshooting assistance before you proceed.

Observe all Safety Guidelines detailed throughout this manual

PROBLEMS (SYMPTOMS)	POSSIBLE CAUSE	RECOMMENDED COURSE OF ACTION
15. Display(s) are blank.	a. Power source is OFF. b. Feeder supply or fuse circuit at power source is blown or tripped, or defective harness or cabling. c. Display or Circuit Boards may be faulty.	
16. Dual Procedure is not functioning when using remote dual procedure switch. Status lights are solid green on Circuit Boards and head boards.	a. Gun has not been selected at the control box. Set dual procedure switch on Circuit Board to gun. Refer to operating instructions. b. Faulty remote dual procedure switch. Remove switch. Check continuity between switch pins with switch open and closed. If it fails the continuity test, repair or replace switch. c. Faulty Local Dual procedure switch.	If all recommended possible areas of misadjustment have been checked and the problem persists, **Contact your local Lincoln Authorized Field Service Facility.**

⚠ CAUTION

If for any reason you do not understand the test procedures or are unable to perform the tests/repairs safely, contact your **Local Lincoln Authorized Field Service Facility** for technical troubleshooting assistance before you proceed.

Observe all Safety Guidelines detailed throughout this manual

PROBLEMS (SYMPTOMS)	POSSIBLE CAUSE	RECOMMENDED COURSE OF ACTION
17. Dual Procedure is not functioning when using the local dual procedure switch (on Circuit Boards). Status lights are solid green on Circuit Boards and Head boards.	a. Faulty local dual procedure switch or Circuit Boards mother board. Disconnect harness plug from J5 of Circuit Board mother board. Check that there is continuity between plug pins 1 and 7 local DPS is in position “A” but not when in gun or “B”. Now check that there is continuity between plug pins 1and 8 when local DPS is in position “B” but not when in “Gun” or “A”. If any of these continuity tests fail, repair or replace switch or switch harness to correct the problem, Otherwise, replace CB mother board.	If all recommended possible areas of misadjustment have been checked and the problem persists, **Contact your local Lincoln Authorized Field Service Facility.**
18. Wire feed speed is consistent and adjustable, but operates at the wrong speed.	a. Dip switch on feed head board does not match gear ratio used at gear box. If using a high speed gear, the feed head PC board dip switch 8 must be set to 1 or “ON”. b. Feed head board is not properly reading DIP switch. Replace feed head PC board.	
19. Status LED not solid green	a. see LED Status Light Chart.	

⚠ CAUTION

If for any reason you do not understand the test procedures or are unable to perform the tests/repairs safely, contact your **Local Lincoln Authorized Field Service Facility** for technical troubleshooting assistance before you proceed.

Observe all Safety Guidelines detailed throughout this manual

Note: For any Err # listed below write down the error number for reference and try cycling power to see if the error clears itself. If not, refer to the What to Do column for the given Err.

PROBLEMS (SYMPTOMS)	POSSIBLE CAUSE	RECOMMENDED COURSE OF ACTION
Display shows any of the following:		
Err 001	More than 1 Circuit Board with the same group number.	Make sure the group dip switch setting is unique for each Circuit Board.
Err 003	Too many objects in group.	A given group can only support up to 7 objects. Remove any objects over 7 from the group either by changing the group dip switch settings or physically disconnecting any objects over 7 in the group.
Err 004	More than 1 object of the same equipment type with the same group # and feed head #.	Adjust the dip switch setting to make either the group # or feed head # unique for all objects of the same equipment type.
Err 005	A feed head has its feed head dip switches set to zero in a group with more than one object.	The appropriate feed head # is 1 through 7. Check the dip switch setting chart in INSTALLATION section and set the switches to make the Feed head ID non-zero.
Err 006	Did not receive a recognition command from the power source.	Check to see if the status light is not solid green on the power source (refer to status light states in OPERATION section if not). Also, check continuity in the communication lines from CB to Power Source (refer to wiring diagram). Refer to Power source trouble shooting section for additional information. If all these avenues fail, replace CB mother PC board.

⚠ CAUTION

If for any reason you do not understand the test procedures or are unable to perform the tests/repairs safely, contact your **Local Lincoln Authorized Field Service Facility** for technical troubleshooting assistance before you proceed.

Note: For any Err # listed below write down the error number for reference and try cycling power to see if the error clears itself. If not, refer to the What to Do column for the given Err.

PROBLEMS (SYMPTOMS)	POSSIBLE CAUSE	RECOMMENDED COURSE OF ACTION
Display shows any of the following:		
Err 020	An attempt was made to reprogram a Circuit Board or feed head but the program did not verify.	Check for potential electrical HF noise generators in the area. Try removing the noise source and programming again. If the Err 020 still occurs, either replace the EEPROM chip(s) in the board being reprogrammed or replace the whole PC board being reprogrammed.
Err 100	The Power Source issued a shut down command for some reason.	See what to Do on Err 006.
Err 200	No Heart beat response from the Power Source.	See what to Do on Err 006.
Err 201	No heart beat response from an object.	If this occurs while welding, the status LED should be flashing red on the object that lost heart beat. Otherwise, look for any nodes that are flashing green. This indicates they have not been recognized and there is a power source problem (see power source trouble shooting section). If the status LED is either flashing or solid red, there may be a problem with continuity in the communication lines. Check the lines for continuity, in the cable and harnessing (refer to wiring diagram).
Err 210	EEPROM error.	Parameter recalled at power up was out of range. Rotate Encoder Knob to reset. Check all settings before proceeding to weld. If this condition persists then replace the Circuit Board mother PC board.

⚠ CAUTION

If for any reason you do not understand the test procedures or are unable to perform the tests/repairs safely, contact your **Local Lincoln Authorized Field Service Facility** for technical troubleshooting assistance before you proceed.

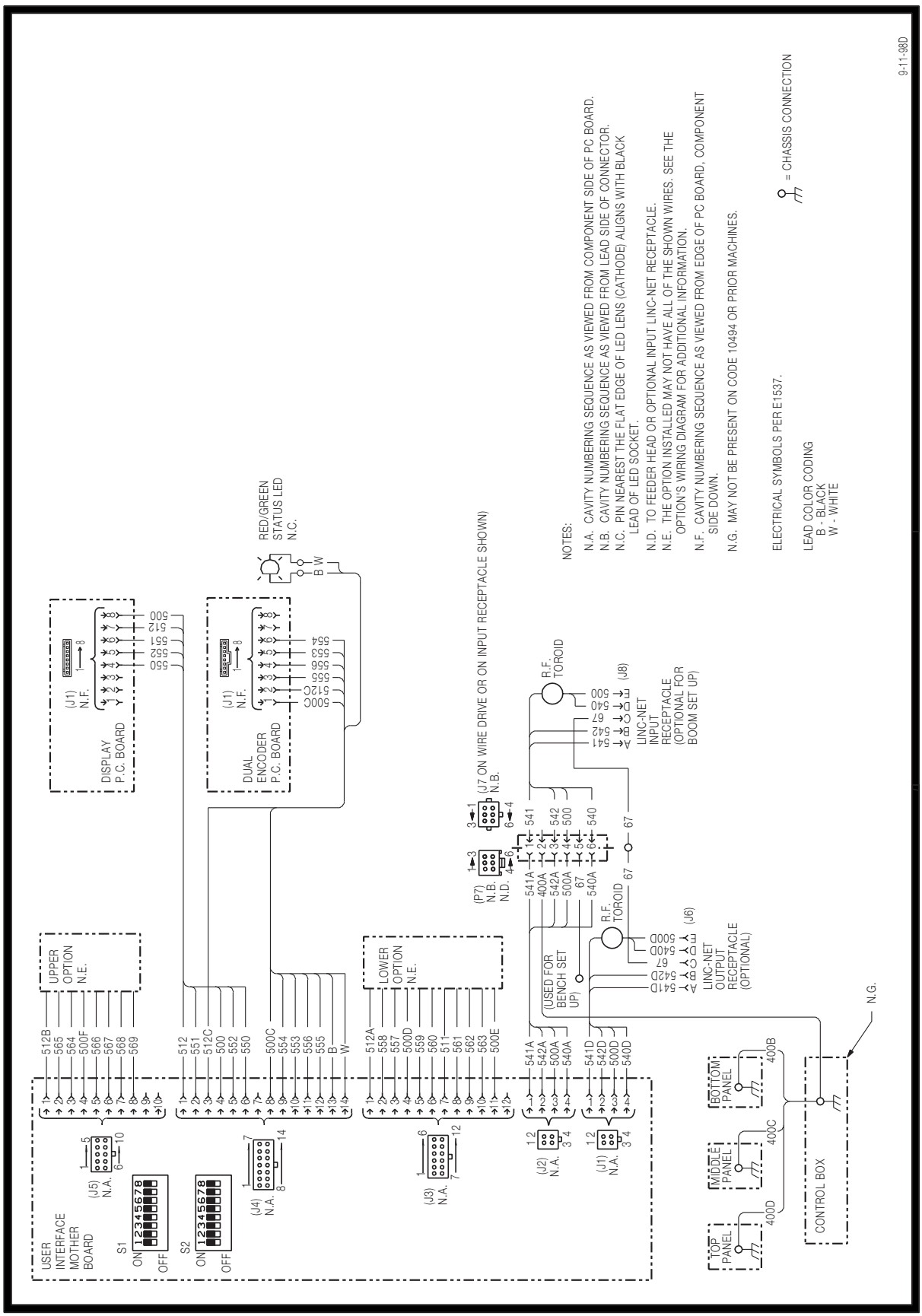
Note: For any Err # listed below write down the error number for reference and try cycling power to see if the error clears itself. If not, refer to the What to Do column for the given Err.

PROBLEMS (SYMPTOMS)	POSSIBLE CAUSE	RECOMMENDED COURSE OF ACTION
Display shows any of the following:		
Err 211	Microprocessor RAM error in Control Box.	Turn Power off at power source. Wait 5 seconds. Turn power back on. If Err 211 is displayed again, then replace CB mother PC board.
Err 212	Microprocessor RAM Error in object board other than Control Box (Such as feed head).	Cycle power as in Err 211. If Err 212 is still displayed, then replace the PC board in the object with the fault. The object with the fault should be solid red on its status LED.
- - - (three dashes)	Appears on right display of Circuit Board module that contains the status LED.	This is an indication that a constant current such as stick or gauge mode has been selected. Turning the right encoder clockwise when in this state will activate output to Power Source. Turning the right encoder counter-clockwise will deactivate output.

⚠ CAUTION

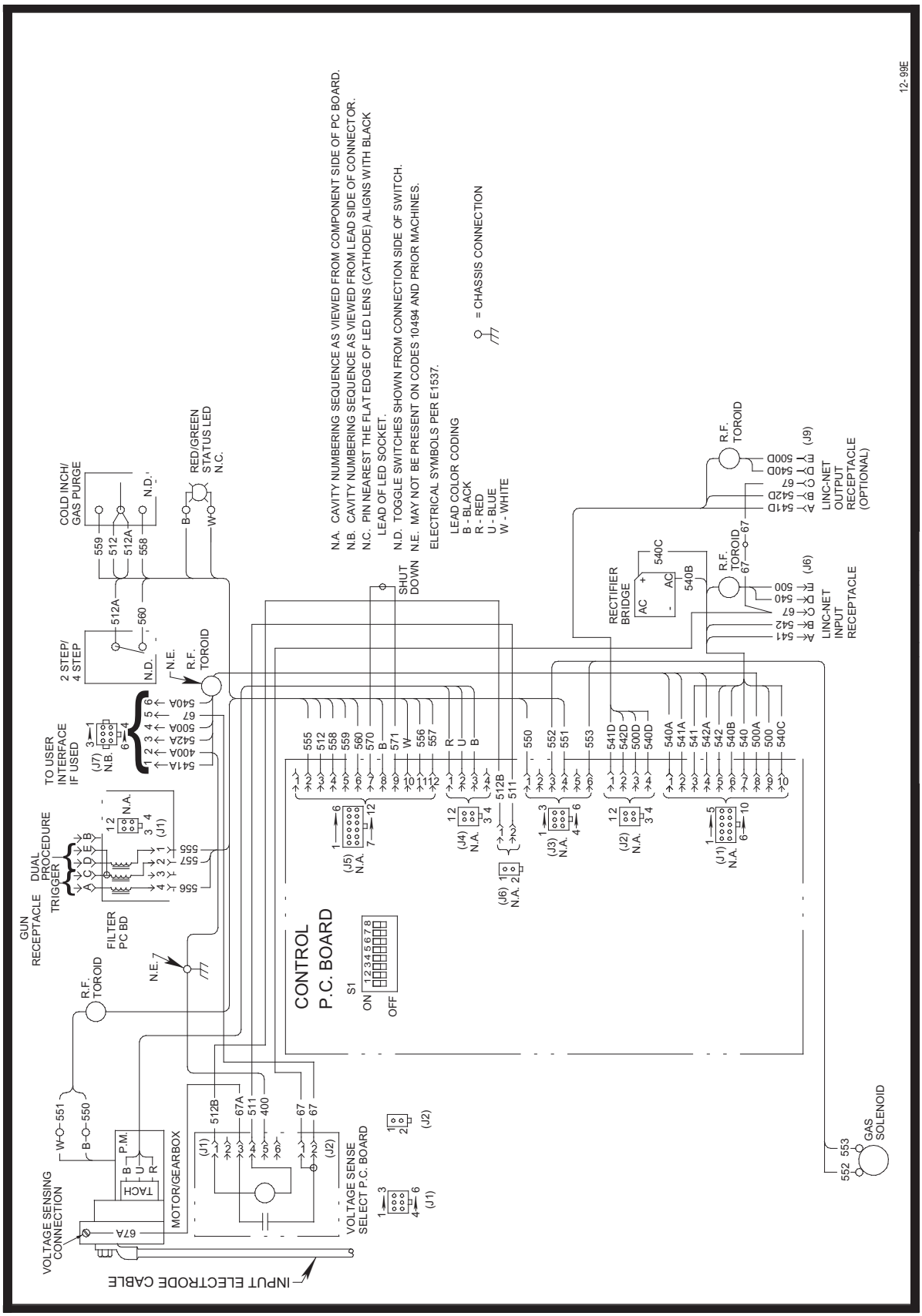
If for any reason you do not understand the test procedures or are unable to perform the tests/repairs safely, contact your **Local Lincoln Authorized Field Service Facility** for technical troubleshooting assistance before you proceed.

WIRING DIAGRAM POWER FEED 10 CONTROL BOX


USER INTERFACE MOTHER BOARD
S1
S2
ON
OFF
(J5) N.A.
(J4) N.A.
(J3) N.A.
(J2) N.A.
(J1) N.A.
UPPER OPTION N.E.
LOWER OPTION N.E.
DISPLAY P.C. BOARD
DUAL ENCODER P.C. BOARD
(J1) N.F.
RED/GREEN STATUS LED N.C.
(P7) N.B. N.D.
(J7 ON WIRE DRIVE OR ON INPUT RECEPTACLE SHOWN) N.B.
R.F. TOROID
LINC-NET INPUT RECEPTACLE (OPTIONAL FOR BOOM SET UP)
(J8)
(USED FOR BENCH SET UP)
LINC-NET OUTPUT RECEPTACLE (OPTIONAL)
(J6)
TOP PANEL
MIDDLE PANEL
BOTTOM PANEL
CONTROL BOX
N.G.
NOTES:
N.A. CAVITY NUMBERING SEQUENCE AS VIEWED FROM COMPONENT SIDE OF PC BOARD.
N.B. CAVITY NUMBERING SEQUENCE AS VIEWED FROM LEAD SIDE OF CONNECTOR.
N.C. PIN NEAREST THE FLAT EDGE OF LED LENS (CATHODE) ALIGNS WITH BLACK LEAD OF LED SOCKET.
N.D. TO FEEDER HEAD OR OPTIONAL INPUT LINC-NET RECEPTACLE.
N.E. THE OPTION INSTALLED MAY NOT HAVE ALL OF THE SHOWN WIRES. SEE THE OPTION'S WIRING DIAGRAM FOR ADDITIONAL INFORMATION.
N.F. CAVITY NUMBERING SEQUENCE AS VIEWED FROM EDGE OF PC BOARD, COMPONENT SIDE DOWN.
N.G. MAY NOT BE PRESENT ON CODE 10494 OR PRIOR MACHINES.
ELECTRICAL SYMBOLS PER E1537.
= CHASSIS CONNECTION
LEAD COLOR CODING
B - BLACK
W - WHITE
9-11-98D
L10586

NOTE: This diagram is for reference only. It may not be accurate for all machines covered by this manual. The specific diagram for a particular code is pasted inside the machine on one of the enclosure panels. If the diagram is illegible, write to the Service Department for a replacement. Give the equipment code number..

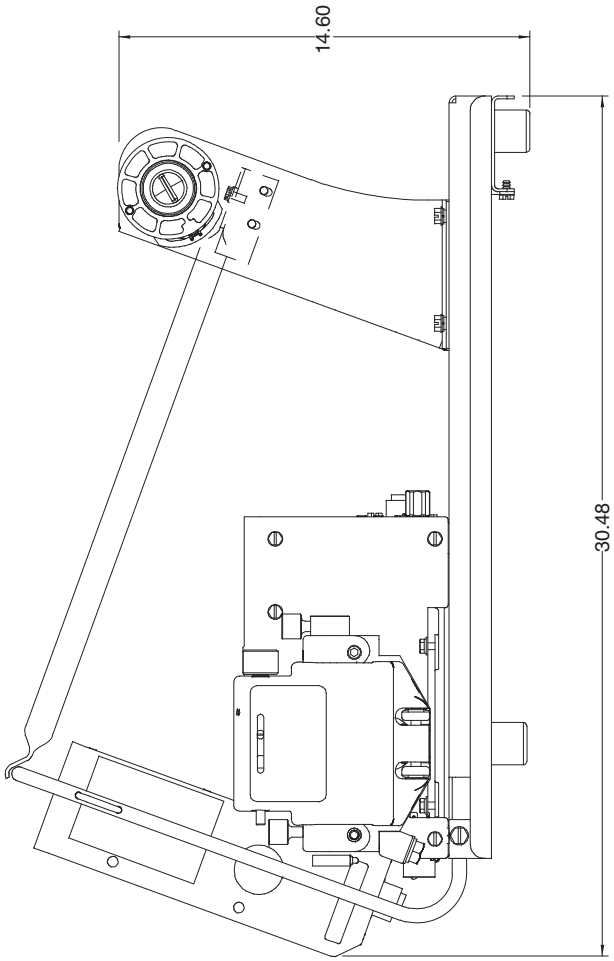
WIRING DIAGRAM POWER FEED 10 WIRE DRIVE


N.A. CAVITY NUMBERING SEQUENCE AS VIEWED FROM COMPONENT SIDE OF PC BOARD.
N.B. CAVITY NUMBERING SEQUENCE AS VIEWED FROM LEAD SIDE OF CONNECTOR.
N.C. PIN NEAREST THE FLAT EDGE OF LED LENS (CATHODE) ALIGNS WITH BLACK LEAD OF LED SOCKET.
N.D. TOGGLE SWITCHES SHOWN FROM CONNECTION SIDE OF SWITCH.
N.E. MAY NOT BE PRESENT ON CODES 10494 AND PRIOR MACHINES.
ELECTRICAL SYMBOLS PER E1537.
LEAD COLOR CODING
B - BLACK
R - RED
U - BLUE
W - WHITE
= CHASSIS CONNECTION
CONTROL P.C. BOARD
S1
ON
OFF
GUN RECEPTACLE
DUAL PROCEDURE TRIGGER
FILTER PC BD
R.F. TOROID
TO USER INTERFACE IF USED
2 STEP/ 4 STEP
COLD INCH/ GAS PURGE
RED/GREEN STATUS LED
SHUT DOWN
RECTIFIER BRIDGE
LINC-NET INPUT RECEPTACLE
LINC-NET OUTPUT RECEPTACLE (OPTIONAL)
MOTOR/GEARBOX
TACH
P.M.
VOLTAGE SENSING CONNECTION
VOLTAGE SENSE SELECT P.C. BOARD
GAS SOLENOID
INPUT ELECTRODE CABLE
12- 99E

L10587

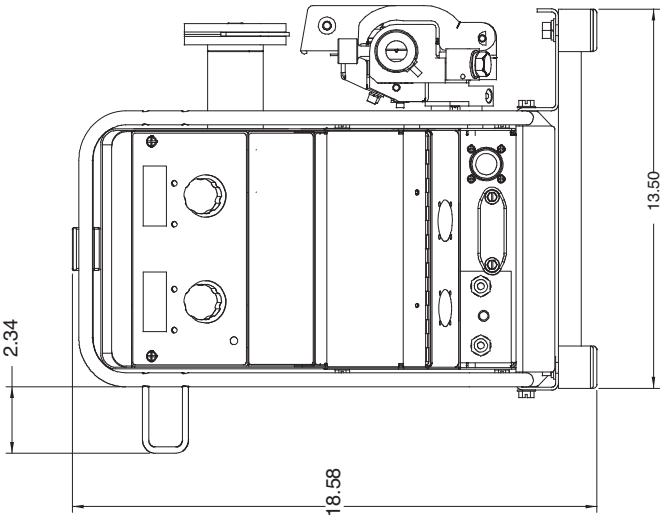
NOTE: This diagram is for reference only. It may not be accurate for all machines covered by this manual. The specific diagram for a particular code is pasted inside the machine on one of the enclosure panels. If the diagram is illegible, write to the Service Department for a replacement. Give the equipment code number..

POWER FEED 10



7-2000
L10599

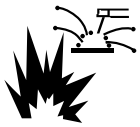
DIMENSION PRINT



NOTES

NOTES

NOTES

			
WARNING	● Do not touch electrically live parts or electrode with skin or wet clothing. ● Insulate yourself from work and ground.	● Keep flammable materials away.	● Wear eye, ear and body protection.
Spanish **AVISO DE PRECAUCION**	● No toque las partes o los electrodos bajo carga con la piel o ropa mojada. ● Aislese del trabajo y de la tierra.	● Mantenga el material combustible fuera del área de trabajo.	● Protéjase los ojos, los oídos y el cuerpo.
French **ATTENTION**	● Ne laissez ni la peau ni des vêtements mouillés entrer en contact avec des pièces sous tension. ● Isolez-vous du travail et de la terre.	● Gardez à l'écart de tout matériel inflammable.	● Protégez vos yeux, vos oreilles et votre corps.
German **WARNUNG**	● Berühren Sie keine stromführenden Teile oder Elektroden mit Ihrem Körper oder feuchter Kleidung! ● Isolieren Sie sich von den Elektroden und dem Erdboden!	● Entfernen Sie brennbarres Material!	● Tragen Sie Augen-, Ohren- und Körperschutz!
Portuguese **ATENÇÃO**	● Não toque partes elétricas e electrodos com a pele ou roupa molhada. ● Isole-se da peça e terra.	● Mantenha inflamáveis bem guardados.	● Use proteção para a vista, ouvido e corpo.
Japanese **注意事項**	● 通電中の電気部品、又は溶材にヒフやぬれた布で触れないこと。 ● 施工物やアースから身体が絶縁されている様にして下さい。	● 燃えやすいものの側での溶接作業は絶対にしてはなりません。	● 目、耳及び身体に保護具をして下さい。
Chinese **警 告**	● 皮肤或濕衣物切勿接觸帶電部件及銲條。 ● 使你自己與地面和工件絕緣。	● 把一切易燃物品移離工作場所。	● 佩戴眼、耳及身體勞動保護用具。
Korean **위 험**	● 전도체나 용접봉을 젖은 헝겁 또는 피부로 절대 접촉치 마십시요. ● 모재와 접지를 접촉치 마십시요.	● 인화성 물질을 접근 시키지 마시요.	● 눈, 귀와 몸에 보호장구를 착용하십시요.
Arabic **تحذير**	● لا تلمس الاجزاء التي يسري فيها التيار الكهربائي أو الالكترود بجلد الجسم أو بالملابس المبللة بالماء. ● ضع عازلا على جسمك خلال العمل.	● ضع المواد القابلة للاشتعال في مكان بعيد.	● ضع أدوات وملابس واقية على عينيك وأذنيك وجسمك.

READ AND UNDERSTAND THE MANUFACTURER'S INSTRUCTION FOR THIS EQUIPMENT AND THE CONSUMABLES TO BE USED AND FOLLOW YOUR EMPLOYER'S SAFETY PRACTICES.

SE RECOMIENDA LEER Y ENTENDER LAS INSTRUCCIONES DEL FABRICANTE PARA EL USO DE ESTE EQUIPO Y LOS CONSUMIBLES QUE VA A UTILIZAR, SIGA LAS MEDIDAS DE SEGURIDAD DE SU SUPERVISOR.

LISEZ ET COMPRENEZ LES INSTRUCTIONS DU FABRICANT EN CE QUI REGARDE CET EQUIPMENT ET LES PRODUITS A ETRE EMPLOYES ET SUIVEZ LES PROCEDURES DE SECURITE DE VOTRE EMPLOYEUR.

LESEN SIE UND BEFOLGEN SIE DIE BETRIEBSANLEITUNG DER ANLAGE UND DEN ELEKTRODENEINSATZ DES HERSTELLERS. DIE UNFALLVERHÜTUNGSVORSCHRIFTEN DES ARBEITGEBERS SIND EBENFALLS ZU BEACHTEN.

● Keep your head out of fumes. ● Use ventilation or exhaust to remove fumes from breathing zone.	● Turn power off before servicing.	● Do not operate with panel open or guards off.	**WARNING**
● Los humos fuera de la zona de respiración. ● Mantenga la cabeza fuera de los humos. Utilice ventilación o aspiración para gases.	● Desconectar el cable de alimentación de poder de la máquina antes de iniciar cualquier servicio.	● No operar con panel abierto o guardas quitadas.	Spanish **AVISO DE PRECAUCION**
● Gardez la tête à l'écart des fumées. ● Utilisez un ventilateur ou un aspirateur pour ôter les fumées des zones de travail.	● Débranchez le courant avant l'entretien.	● N'opérez pas avec les panneaux ouverts ou avec les dispositifs de protection enlevés.	French **ATTENTION**
● Vermeiden Sie das Einatmen von Schweibrauch! ● Sorgen Sie für gute Be- und Entlüftung des Arbeitsplatzes!	● Strom vor Wartungsarbeiten abschalten! (Netzstrom völlig öffnen; Maschine anhalten!)	● Anlage nie ohne Schutzgehäuse oder Innenschutzverkleidung in Betrieb setzen!	German **WARNUNG**
● Mantenha seu rosto da fumaça. ● Use ventilação e exhaustão para remover fumo da zona respiratória.	● Não opere com as tampas removidas. ● Desligue a corrente antes de fazer serviço. ● Não toque as partes elétricas nuas.	● Mantenha-se afastado das partes moventes. ● Não opere com os paineis abertos ou guardas removidas.	Portuguese **ATENÇÃO**
● ヒュームから頭を離すようにして下さい。 ● 換気や排煙に十分留意して下さい。	● メンテナンス・サービスに取りかかる際には、まず電源スイッチを必ず切って下さい。	● パネルやカバーを取り外したままで機械操作をしないで下さい。	Japanese **注意事項**
●頭部遠離煙霧。 ●在呼吸區使用通風或排風器除煙。	●維修前切斷電源。	●儀表板打開或沒有安全罩時不準作業。	Chinese **警 告**
● 얼굴로부터 용접가스를 멀리하십시요. ● 호흡지역으로부터 용접가스를 제거하기 위해 가스제거기나 통풍기를 사용하십시요.	● 보수전에 전원을 차단하십시요.	● 판넬이 열린 상태로 작동치 마십시요.	Korean **위 험**
● ابعد رأسك بعيداً عن الدخان. ● استعمل التهوية أو جهاز ضغط الدخان للخارج لكي تبعد الدخان عن المنطقة التي تتنفس فيها.	● اقطع التيار الكهربائي قبل القيام بأية صيانة.	● لا تشغل هذا الجهاز اذا كانت الاغطية الحديدية الواقية ليست عليه.	Arabic **تحذير**

LEIA E COMPREENDA AS INSTRUÇÕES DO FABRICANTE PARA ESTE EQUIPAMENTO E AS PARTES DE USO, E SIGA AS PRÁTICAS DE SEGURANÇA DO EMPREGADOR.

使う機械や溶材のメーカーの指示書をよく読み、まず理解して下さい。そして貴社の安全規定に従って下さい。

請詳細閱讀並理解製造廠提供的説明以及應該使用的銀捍材料，並請遵守貴方的有関勞動保護規定。

이 제품에 동봉된 작업지침서를 숙지하시고 귀사의 작업자 안전수칙을 준수하시기 바랍니다.

اقرأ بتمعن وافهم تعليمات المصنع المنتج لهذه المعدات والمواد قبل استعمالها واتبع تعليمات الوقاية لصاحب العمل.

LINCOLN® ELECTRIC

• World's Leader in Welding and Cutting Products •

• Sales and Service through Subsidiaries and Distributors Worldwide •

Cleveland, Ohio 44117-1199 U.S.A. TEL: 216.481.8100 FAX: 216.486.1751 WEB SITE: www.lincolnelectric.com